

Ecological Economic Development Goals: Reincorporating the social sphere in ecological economic theory and practice

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

The various approaches and methods within ecological economics all have their benefits, limitations, and internal debates. In this dissertation, I focus on macro-social theoretical ecological economics which seeks to find large patterns of opportunity for dealing with the cycles of socio-ecological and socio-economic life over time. In doing so, I broadly critique other areas of ecological economics, mainly in their lackluster attempts at including the social sphere in their analysis. While many are interested in ensuring that we have an economy that fits within the biosphere, they ignore the question of whether it will also fit within the social sphere. There tends to be very little focus on what a sustainable society might look like and how the economy might fit into that. It is much more common for a scholar to look at how society views nature, and to have the economy reflect that. It is a subtle but important difference. One puts society as a central tenet for shaping the economy and the other uses existing economic systems to measure how society values their environment. In my research, I argue that the economy needs to be seen as a subsystem of an eco-social system, and thus we need to determine what a ‘healthy’ social system is, and how the economy could service that.

I present a reconfigured framework for ecological economics which explicates social and cultural dimensions for local economic change drawing on Polanyian economics – economics submerged in social relations – and early ecological economic work by Herman Daly. I provide a framework for ensuring future inclusion of the ecological economic social sphere in the development of a realistic green economic vision. I use lessons learned from a case-study of Maker Culture in Prince Edward Island and Southern Ontario, alongside historical sociology to suggest what a healthy ecological economic social sphere might look like. The work on historical

sociology draws on work from Weber, Marx, and Durkheim and modern sociologists Rifkin, Pinker, and Bauman.

Throughout my dissertation I question if we can continue to have a progressive, high-tech, and multicultural lifestyle while being environmentally and socially responsible. The results from the case study indicate early signs of strong out group antagonism and reduced value on science within degrowth communities. This suggests that within the social sphere there may be cherished liberal processes undermined by the process of degrowth.

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Dedication

Everything I have ever done, am doing, or will do, is for my NoryNu.

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“Write it. Shoot it. Publish it. Crochet it, sauté it, whatever. Make.”

– Joss Whedon

1. Introduction



Figure 1: Earthrise (public domain image)

The iconic image *Earthrise* (NASA 1969; Figure 1) depicting the Earth set against a dark and vast backdrop of space reinvigorated environmentalism. It was one of the first affective emotional experiences shared by humanity and engendered a sense of fragility and beauty of the “Spaceship Earth” (Boulding 1966). It ignited ongoing debates regarding the nature of planetary boundaries. *Limits to Growth* (Meadows et al. 1972), published shortly after *Earthrise*, posed a difficult question about how much economic growth Earth could continue to support. The truth in *Limits to Growth*, was ignored in the West as increasing progress, prosperity, and wealth enchanted the minds of the emerging middle and upper classes of North America. Neo-Malthusianism literature (Ophuls 1977) became a prominent voice spawning radical movement on the fringe such as John Zerzan and Ted Kaczynski. A potential saving grace arose in 1982 with the Brundtland Report offering “sustainable development” as an alternative (World Commission on Environment and Development 1987). The Report called for “development that

meets the needs of the present without compromising the ability of future generations to meet their own needs” (section 3.27). Based on this, the following decades of environmental action became defined by the notion that growth, modern comforts, and global development could continue while addressing environmental and economic issues presented in *Limits to Growth*. Legislative procedures and international conferences convened to find ways to enforce sustainable development, but the environmental agenda failed to gain sufficient traction (Elliott 2004).

The failure of sustainable development, due largely to the mass appeal of consumerism, to appropriately respond to environmental challenges is evident in many trends such as resource depletion, loss of biodiversity, pressure on a variety of environs, and climate change (Berman, 1988; Diamond, 2011; Hansen, 2007; Heinberg, 2005; Homer-Dixon, 2007; Kunstler, 2005; Quilley, 2011; Tainter, 1988). While multinational treaties like the *Kyoto Protocol* and the *Paris Agreement* engendered optimism about political change, growing ideological, economic and environmental challenges have led to dwindling optimism in the twenty-first century. This was further challenged with the United States abandoning Kyoto while Al Gore’s *An Inconvenient Truth*, the Stern Report and a growing number of intense weather events all highlight climate change as an overwhelming and catastrophic problem (Guggenheim 2006). Reports suggesting societal collapse (Ahmed 2014; Mukerjee 2012; Pappas 2012; Upton 2014), surges in apocalyptic pop culture (Clarke 2006; Dark 2002; Gross and Gilles 2012; Keane 2006), passing of planetary boundaries (Cooney 2012; Rockstrom et al. 2009), and emergence of the term “Anthropocene” as a new geological era characterized by humanity’s immense impact on the Earth (De Vries, Goudsblom, & Rijksinstituut voor Volksgezondheid en Milieu, 2003; Richter,

2007; Ruddiman, 2010; Zalasiewicz, Williams, Steffen, & Crutzen, 2010) all suggest a declining confidence in sustainable development and humanity's ability to forestall these problems.

As environmentalists and scholars attempted to come to grips with the idea of limits and governmental inability to respond, a variety of responses materialised. Dryzek represents these attempts as a collection of discourses. A discourse is "a shared way of apprehending the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories" (2005, p. 9).

Dryzek's classification of environmental discourses centres on 'prosaic' or 'imaginative' departures from industrial political-economy through 'reformist' or 'radical' strategies. Dryzek's approach suggests that 'limits' is one of several independent discourses. Quilley argues, that in actuality, 'limits' is the framing problem to which all shades of environmental politics respond. Quilley (2015) clarifies this by including the 'framing of limits' as a third dimension in discourse classification. In his view, the discourse debate falls under three primary classifications: 1) rejecting limits; 2) fudging limits; 3) and accepting limits. I have shown these three classifications on a timeline in Figure 2 with discourses sorted along the lines.

The explicit rejection of the idea of limits has come from economists (Solow 1974; Shellenberger and Nordhaus 2009), political scientists (Lomborg 2001, 2010; Ridley 2011) and technological optimists (Segal 2005; Beggs 2009; Kaku 1998; Diamandis and Kotler 2012). A compelling case for the rejection of limits comes from the perceived potentials of human ingenuity through technological innovation. Diamandis and Kotler argue that 'dematerialization' and 'ephemeralization' of technology allow people to perform more tasks while using less physical and/or technological resources (2012). This implies that in the future less material will be required to create objects. The physical laws of thermodynamics (Ophuls 1977; Rifkin and

Howard 1980) potentially undermine the argument of exponential growth of dematerialization. Additionally, a classical ‘precautionary’ argument points to the unpredictability of such technology in growing at a necessary, and guaranteed, rate.

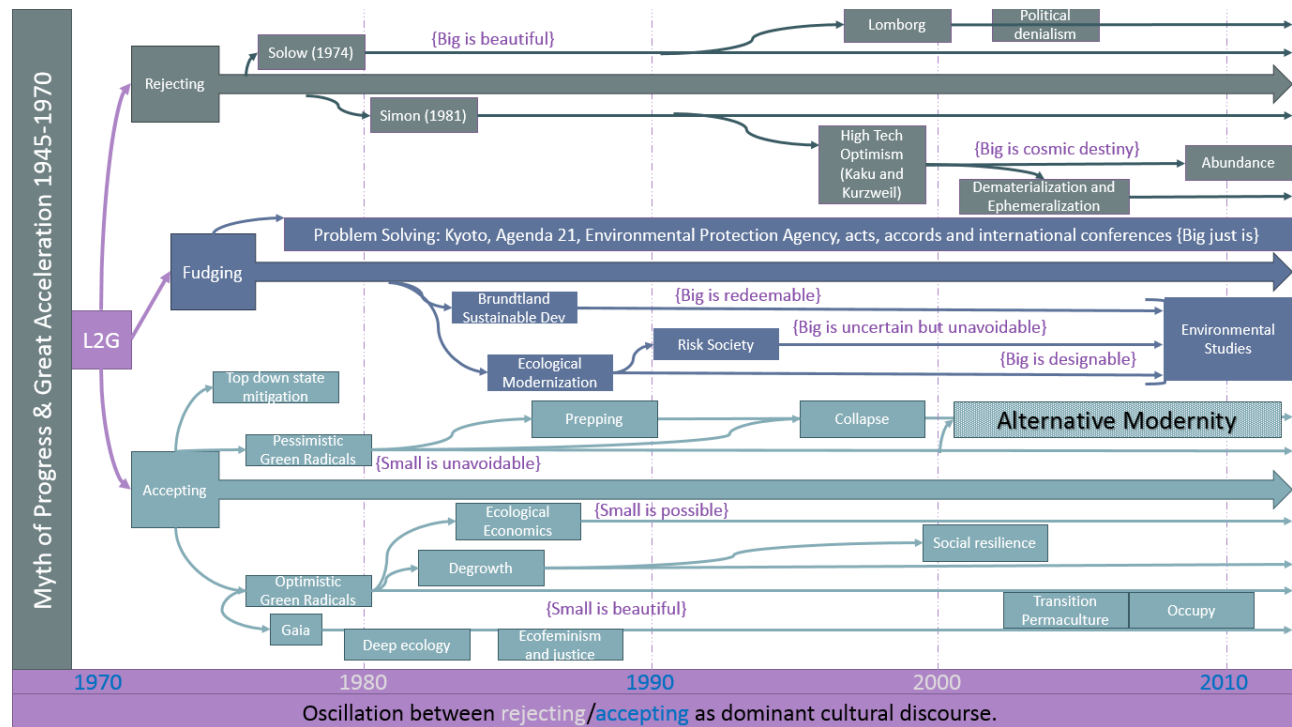


Figure 2: Environmental responses to 'limits to growth' over time

Mainstream environmental approaches both acknowledge and strategically obscure the implications of the idea of limits. Early approaches focused on problem solving through various acts, accords and international agreements (Elliott 2004). Sustainable development later emerged as the most prominent ‘fudging’ discourse (Daly 1990; Dobson 2007; Giddings, Hopwood, and O’Brien 2002; Hopwood, Mellor, and O’Brien 2005; Kemp, Parto, and Gibson 2005; Redclift 2005; Robinson 2004). The Brundtland Report (1989) described the need for change, yet still emphasised development as a key motivator and goal of the future. It offered sustainable development as an alternative to fundamental behavioural changes.

The pervasiveness of sustainable development language is expected; it combines liberal ideals of social justice and intergenerational equity while simultaneously supporting ecological protection and economic growth (Dryzek 2005, 145). This vague catch-all term allows for economic and technological development, such as ‘ecological modernisation’, to be compatible with limits, rather than a cause for concern (Mol, Sonnenfeld, and Spaargaren 2009).

There are now greater numbers of scholars beginning to accept the notions of limits as a premise in their work. The most recent influential academic contribution to discourses ‘accepting limits’ comes from optimistic green radicals at the Stockholm Resilience Center in their work on ‘planetary boundaries’. Planetary boundaries are “key Earth System processes and attempt[s] to quantify for each process the boundary level that should not be transgressed if we are to avoid unacceptable global environmental change” (Rockstrom et al. 2009). Planetary boundaries rests on three veins of scientific inquiry: 1) “the scale of human action in relation to the capacity of the Earth to sustain it” including work on the necessary role of the biosphere for human well-being (Odum 1989), 2) “work on understanding essential Earth System processes including human action”, and 3) “the framework of resilience and its links to complex dynamics and self-regulation of living systems” (Rockstrom et al. 2009). Planetary Boundaries analysis does little to incorporate social and cultural dimensions in its framework. This resulted in the uptake of two responses: the UN Sustainable Development Goals (SDGs) and Doughnut Economics.

The UN SDGs are “a detailed dashboard of goals and targets agreed to by all 193 UN member countries” (Costanza, Fioramonti, and Kubiszewski 2016) which claim to promote a “holistic plan for action on all fronts – social, economic and environmental” (OECD 2013). However: in a presentation by Mathis Wackernagle he pointed out that as countries meet the SDGs their Ecological Footprint increases beyond available biocapacity and that we have yet to

see a country in the ‘sweet spot’ (Wackernagel 2017) suggesting that ‘sustainability’ and ‘development’ are mutually exclusive. That is, unless we redefine what ‘development’ might look like: “practitioners will have to clarify how the goals and targets interconnect, including trade-offs” (Costanza, Fioramonti, and Kubiszewski 2016). As of now, the development goals of the UN SDGs are firmly rooted in the same economic paradigm as growth economics, which is a problem I explore at length in Chapter 4.

Doughnut Economics attempts to combine planetary boundaries and the UN SDGs:

“The Doughnut combines two concentric radar charts to depict the two boundaries—social and ecological—that together encompass human wellbeing. The inner boundary is a social foundation, below which lie shortfalls in wellbeing, such as hunger, ill health, illiteracy, and energy poverty. Its twelve dimensions and their illustrative indicators are derived from internationally agreed minimum standards for human wellbeing, as established in 2015 by the Sustainable Development Goals adopted by all member states of the United Nations” (Raworth 2017).

Given that this approach relies on the UN SDGs, it has similar issues.

Pessimistic green radicals internalize that mutual exclusion and see the world as on an irreversible slide downwards, they (Heinberg 2005; Kunstler 2012; Greer 2012; Homer-Dixon 2007) argue that the modern world is “sliding into pathology” toward an end that would sink into the “abyss of a new dark age” (Odum and Odum 2001, p. 12). Peak oil and energy scarcity are primary arguments from these scholars (though certainly not the only argument made for potential collapse). For instance, Heinberg argues that peak oil is the primary problem, calling for radical reduction in consumption (2010, 10). The stark pessimism is intensified in some suggestion that these changes are unlikely to happen (Greer 2014, p. 264–266). Joseph Tainter in *The Collapse of Complex Societies* (1988) shares their sentiment. According to Tainter, once a society has entered a stage characterised by declining marginal returns, collapse is likely, while also recognizing that this is part of a necessary cycle (1988, 198). More optimistic green radicalism comes from ecological economics (Daly 1997; Dietz, O’Neill, and Daly 2012; Victor

2008), Degrowth (Cattaneo et al. 2012; Kallis, Kerschner, and Martinez-Alier 2012; Nørgård 2013) and socio-ecological resilience which underpins the other two disciplines (F. S. Brand and Jax 2007; Carl Folke 2002; B. H. Walker and Salt 2006; C. Wilkinson 2012).

“Degrowth” refers to the intentional downscaling of economic activity (particularly consumption, and by extension production) to reduce humanity’s overall ecological footprint. Degrowth has become a unifying theme among some environmental actors for responding to issues outlined above (Bauhardt 2014; Cattaneo et al. 2012; Kallis, Kerschner, and Martinez-Alier 2012; Lorek and Fuchs 2013; Martínez-Alier 2012; Nørgård 2013; Romano 2012; Sorman and Giampietro 2013). They argue that only by contracting the economy can governments adequately respond to environmental issues. Instead, national governments have focused on economic recovery, promoting that economies are starting to grow again. Heinberg argues that this new mode of growth is not growth at all and that systemic failures of the economic system and limits of environmental systems mean that growth is over. In saying this, he means that it is not advancing humanity because it is degrading the environment. Daly highlights how the obsession with ‘growth’ is pervasive:

“Growth is widely thought to be the panacea for all the major economic ills of the modern world. Poverty? Just grow the economy (that is, increase the production of goods and services and spur consumer spending) and watch wealth trickle down. Don’t try to redistribute wealth from rich to poor, because that slows growth. Unemployment? Increase demand for goods and services by lowering interest rates on loans and stimulating investment, which leads to more jobs as well as growth. Overpopulation? Just push economic growth and rely on the resulting demographic transition to reduce birth rates, as it did in the industrial nations during the 20th century. Environmental degradation? Trust in the environmental Kuznets curve, an empirical relation purporting to show that with ongoing growth in gross domestic product (GDP), pollution at first increases but then reaches a maximum and declines”

(Daly 2005, p. 1).

Options for going forward without growth are outlined by ecological economists, a discipline that explicitly recognizes limits to growth (Daly 1997; Jackson 2009; Victor 2008).

Ecological economics emerged in the late 1970s as an answer to the ineffectiveness of mainstream economics to incorporate the environment as a vital component of a prosperous future. In ecological economics, the economy is conceptualized as a nested subsystem of both the environment and society, meaning it should never threaten the integrity of social or ecological systems, because this would undermine the economy itself. Overtime, the pervasiveness of functionalist approaches to problem solving made its way into ecological economics (Spash 2012). Approaches centering on the causal relationships between the three spheres of ecological economics became more dominant than approaches taking a systems and complexity view of the interrelationships between the spheres. Clive Spash, referenced heavily throughout my dissertation, is one of a few critics to recognize this problem. My primary contribution builds on Spash's critique. I argue that ecological economists focus too narrowly in their approach – mainly on the relationship between the economy and biosphere. In doing so, they neglect to consider the kinds of economic activity that may have negative implications for the social sphere such as degrading social well-being or leading social processes to degrade the environment.

The purpose of this critique is to build the strength of ecological economics in responding to the global crisis described above. I want to improve the discipline of EE because it offers a reasonable and thoughtful approach to the future accompanied by many legitimate tools and techniques to see that vision through. Given that Planetary Boundaries and the UN SDGs are beginning to adopt some of the ideas from ecological economics, it's time for ecological economists to start putting forward radical ideas for system transformation to provide better options for change. I approach this critique with a theoretical framework based in historical sociology: the underlying assumption of my work is that humanity functions within the processes and outcomes of modernity. "Modernity refers to modes of social life or organisation which

emerged in Europe from about the seventeenth century onwards and which subsequently became more or less worldwide in their influence” (Giddens 1990 p. 1) characterised by a change in social attitudes towards the world through the rise of complex economic institutions, the democratic nation-state, and a cultural orientation toward the future.

Influenced primarily by Giddens (1973, 1987, 1990, 1991), Pinker (2012), Rifkin (1989; 2009, 2014), Beck (1992), Elias (2014) and theories of terror management (Arndt et al. 2004; Becker 1973; Greenberg, Pyszczynski, and Solomon 1986; Greenberg, Koole, and Pyszczynski 2004), systems transformation (Berkes, Colding, and Folke 2008; Gunderson and Holling 2001; Walker and Salt 2006), and ecological economics (Daly 1977, 1997; Georgescu-Roegen 1975; Jackson 2009; Victor 2008) my work is premised on the assumption that understanding how humans respond to the problems within this framework of modernity is the underlying driver to understanding effective methods for change and for developing socially and culturally relevant proposals for the future. Contextualizing problematic issues regarding modernity assists in a greater understanding of long-term shifts from traditional to modern society – to explore dominant structures that transformed social life – and how those structures inhibit or encourage desired environmental change. From that, it is possible to understand if and how societies can – or should – move forward within this context of modernity, e.g. foster degrowth. This also leads to an important question about how evolving these processes for a green future may challenge, change, or empower the cultural norms and desires that came out of the process of modernity. Assumptions of a technologically sophisticated, peaceful and liberal future are also potentially challenged (Quilley 2013). Part 1 of my thesis explores this theoretical and historical background:

- Chapter 2: I define the conceptual framework on which my dissertation and research is based. This primarily focuses on ecological economics which I describe, critique, and build upon.
- Chapter 3: I explore several established theories of social change to develop my own framework for understanding change. The theories that I based my framework on are behavioural economics, sociology of radical change, terror management theory, and resilience theory. I conclude Chapter 3 by weaving these four areas of thought together.
- Chapter 4: I expand on the question asked in the introduction – can we find a sweet spot within sustainable development? I use three approaches to demonstrate that we need to think differently about what ‘development’ looks like, if we hope to achieve sustainability.

These three chapters present my approach taken in my field work and in my analysis of outcomes. I use these approaches and frameworks to answer the core question in my thesis:

How can prefigurative communities of practice better inform systemic ecological economic approaches for cultural change and problem solving to maintain a progressive and high quality of life while remaining within limits of the biosphere?

Or: how can existing groups help EE to respond to and evolve beyond the mutual exclusivity of SDG’s and available biocapacity? To help answer this question and test the underlying presuppositions that this is even a relevant question, I use a case study approach which is an “approach or a research strategy that researchers often use in individualized ways to apply to the research setting in question. It is used...in reaching an understanding of the inner dynamics of a unit” (Mills, Durepos, and Wiebe 2010, p.69). This dissertation uses case studies as an up-close social science research method used to make “valid inferences from events outside the laboratory” (ibid, p. 70) such as a cultural system – Maker Culture - within geographic

region(s) - Kitchener Ontario and Charlottetown PEI. I conducted these two case studies to explore how the three spheres of economy, society, and the environment interact with new modes of production and consumption in Maker communities.

Maker Culture is reinventing what used to be known as the “Do It Yourself” movement. Makers “is the name recently coined for individuals or groups producing objects as part of a do-it-yourself culture. That definition is itself extremely vague, in part, because the Maker Movement is simultaneously heterogeneous, inchoate, and ubiquitous” (van Holm 2014). In this dissertation, the participants consider themselves ‘Makers’. To some extent Makers also represent an implicit rejection or push back against the encroachments of techno-social systems that undermine conscious creative collaborative activity and independence. Makers tend to convene in ‘make(r)spaces’ also known as FabLabs and hackspaces:

“FabLabs are part of a larger global movement of community-based digital fabrication workshops. These spaces also include hackspaces and makespaces, and are typically equipped with both contemporary versatile technologies - CAD, 3D printers, laser cutters, routers -- as well as traditional machines and tools including lathes, drills, sewing machines, and welding equipment”

(Smith 2015).

Members of these spaces mentor one another, share designs, ideas, and tools and create a community around the shared interest of making. This is a part of a growing movement of commons-based peer production (CBPP) (Benkler and Nissenbaum 2006) which has “brought about a new logic of collaboration between networks of people who freely organize around a common goal using shared resources and market-oriented entities that add value on top of or alongside them” (Niaros, Kostakis, and Drechsler 2017). Popular cases of CBPP such as Wikipedia, Linux, and Wordpress, brought forth a new model and paradigm for value creation (Rifkin 2014). Individuals in distributed networks produce meaningful objects “largely without traditional hierarchical organization or, quite often, financial compensation” (Niaros, Kostakis, and Drechsler 2017).

There is a burgeoning network of both Makers and Maker discourse in industrialized countries. Makers have been coined as the “third industrial revolution” (Anderson 2012), a “democratisation of manufacturing” as citizens participate in commons-based production (Benkler and Nissenbaum 2006), unlockers of “grassroots innovation” through accessible digital fabrication (Gershenfeld 2005), grounds for activism towards commons-based peer-production (Bauwen 2013), and as a shining example of emerging “sustainable production and consumption” due to their local provisioning and tendency towards remanufacturing increasing post-consumerist value (Schor 2010). In 2017, the website hackerspaces.org reported 1336 active Makerspaces worldwide, with 355 opening soon, that’s 14 times as many as in 2006 (Lou and Peek 2016).

The resurgence of making comes at the same time as the increasing popularity of online marketplaces, the online sharing economy, innovations in creation such as 3D printers, and a mass movement toward knowledge freedom and sharing with projects like open sourcing, and Massive Open Online Courses. In 2011 nearly 12 000 maker projects raised nearly \$100 million and \$300 million in 2013 (Anderson 2012). By 2016, roughly half of American adults called themselves Makers as there is “an increased awareness of how broad making can be and how inclusive it can be...Makerspaces...have existed for huge amounts of time...woodshops, home-ec centers, model shops, and computer labs” (Lou and Peek 2016). The Maker Map (<http://themakermap.com/>) puts Makers all over the globe, with concentrations in the United States and Europe. Anderson devotes the entirety of Chapter 2 in *Makers: The New Industrial Revolution* to the rise in Maker Culture in North America, Europe, and some parts of Asia (mainly China, India, and Japan): “In short, the Maker Movement has arrived” (2012 p. 22).

Makers represent a unique opportunity for ecological economic research because they disrupt the larger economic system by internalizing production, optimize materials by recycling as often as possible, and support free/open source materials. It is also possible that Makerspaces “open new niches for sustainable innovation in society” (Adrian et al. 2013). Bauwens argues that Makers and Maker communities will have a propensity towards environmental sustainability due to the nature of production (2013), an argument similarly put forth in the 1960s by Bookchin in regard to post-consumerist material cultures (1967). Makers are also an interesting group to research because many environmentalist movements have neglected to tap into the struggle for control over production and distribution – despite this being central to socio-ecological well-being. Since after WWII, American union movements have focused “almost entirely on how to limit the time spent working while maximizing wage and benefit levels” (Young and Schwartz 2012, p. 222). Any revolutionary movement must confront both the “extraction of labour by the capitalist and the abstraction of labour itself...revolutions of the twentieth century failed not because they were too radical but because they were not nearly radical enough” (Holloway 2007, p. 260). Labour, production, and distribution need to be central pieces of socio-environmental activism.

It is also potentially useful that Making has such ubiquity to it; suggesting the possibility for mass appeal through events for kids, innocuous learning groups, and community building. Making has demonstrated wider public benefit such as Makerspaces functioning as community hubs, supporting well-being, and reaching out to excluded groups (Taylor, Hurley, and Connolly 2016). Makers and sharers are directly contributing to an economy that revolves around a cultural practice and ideal of optimizing practices of reduce, reuse, and recycle. I explore these cultural practices in Maker Culture primarily in Kitchener, Ontario and Charlottetown, Prince

Edward Island. I chose Kitchener because the local economic development office has made “making” central to their economic plan. After conducting research in Kitchener, I wanted to see if the outcomes would be similar in a different context. I expanded to include Charlottetown because the local government is struggling with how to make their economy thrive, and Maker Culture is a central part of their solution – this means that Kitchener represents a more typical sample of what I would expect to see in a Makerspace or in another city while Charlottetown represents a more holistic approach to a Maker Economy. In total, I spoke with 99 Makers and 4 city officials. I also include insights from a preliminary study with 49 participants. Part 2 of this dissertation deals directly with the logistics and outcomes of the case studies:

- **Chapter 5:** I review methodologies used during the research, explain the process of data collection, and deal with issues of representation, generalization, and sample size.
- **Chapter 6:** I present the raw results of the data categorized into themes.

While the outcomes of my case study represent a small sample it did highlight areas for further consideration in the proposed framework for social-ecological economics. Overall, I argue that an ecological economic approach to environmental change cannot and should not be framed too narrowly; it is not just about issues like renewable energy or ecosystem service analysis, these are embedded in the relationship between culture and the economy. I discuss the research results in relation to my theoretical framework in Part 3 of the dissertation:

- **Chapter 7:** I focus on lessons learned from this case study by developing a framework for ecological economics that more visibly considers social characteristics of a healthy relationship between the economy and environment, I refer to this framework as Ecological Economic Development Goals (EEDGs). I also present a set of economic applications that help encourage these EEDGs and explore initial indications of challenges to change and

unintended consequences associated with changing the relationship between economy and society.

- **Chapter 8:** I review lessons learned about Makers, possible areas for future research, and my contributions to the field of socio-ecological sustainability.

1.1. Research Approach

Given the interdisciplinary nature of this dissertation, it is important to take a moment to frame the approach that I have taken to answering my research question. My dissertation is founded on complex systems-based philosophy and research within the field of socio-ecological resilience (Gunderson and Holling 2001; Berkes, Colding, and Folke 2008; Berkes and Folke 2000; Holling 1973). I use the framework of resilience and panarchy to frame the way I think about systems transformations over time (section 3.4). I compliment this with lessons from ecological economics and environmental psychology (Chapter 2 and sections 3.1, 3.2, and 3.3). My research is meant to explore the potential of a more holistic ecological economic framework, which I call Ecological Economic Development Goals (EEDGs), for integrating historical sociology, social well-being, resilience, and systems transformations (Chapter 7) into Ecological Economics. I also explore the dangers of unpredictable systems change in Chapters 4 and 7.

As a researcher, I am neither an ecologist nor a sociologist – I sit in the middle of these two fields of studies, an area that is not very well explored. I approach the challenges in this middle ground with a background in systems thinking. This means three important things:

1) The outcomes of systems are often unknown. Therefore, any and all conclusions are circumspect in nature. This is why I have included historical sociology in my discussion of possibilities for the future – the best we can do is look to the past, see what people are doing

now, and compare those to make best guesses about what options for the future might look like on a broader scale. A system can be pushed in one direction through prefigurative political action or policy, but we have no idea where that system might end up. This means that nudging the system is inherently risky, but in relation to the premise of limits to growth, inaction is also risky.

2) Number 1 is particularly true given that the temporal time scale I am working with is longer than many others. Ecological economists work on time scales spanning hundreds of years, rather than seeking solutions for the next immediate generation. People in environmental studies are always implicitly working in different time frames; if we look at environmental issues through the view of the Anthropocene or Holocene there is necessarily a high degree of uncertainty.

Within this time scale, exploring imaginative possibilities is useful as it gives ecological economists time to see how they can slowly infiltrate the existing system and what the realities of that infiltration might mean. These solutions might create more problems, and by exploring existing communities that are already implementing some solutions, we can start to see what these challenges, and opportunities, might be.

3) Systems thinking is predicated upon the acknowledgement that problems are complex and messy. This means that the approach for this research is not to offer a concrete path forward for solving socio-ecological problems, it is to suggest possible ways to tip systems towards new attractors over long periods of time. I present some case studies to offer evidence of what is happening in at least one Maker community in Canada – the extent to which the outcomes are generalizable is low. However, I take lessons learned, apply them to social trends, and offer a framework for testing these ideas in broader contexts. The extent to which someone might assume business as usual works or believes in the possibilities of green growth, influences the

extent to which that person may see these case studies as more trivial or uninteresting. It is in taking limits to growth seriously over a long time frame, as I do, that this kind of exploration becomes much more significant as prefigurations of future possibilities both good and bad.

This dissertation provides an interdisciplinary overview of relevant conceptual models including approaches to understanding relationships in socio-ecological systems over time, ways of viewing social system transformations, and approaches to understanding the implications of that change. I apply the research outcomes of my case studies to these conceptual and theoretical models by producing the EEDGs for future ecological economic research and analysis. This dissertation work provides ecological economists and social systems thinkers with an explicit base to integrate the complexities of social systems transformations with the concrete possibilities explored in various branches of ecological economics.

Overall, this research is a form of exploratory case study, as opposed to explanatory or descriptive (Robson 1993). Robson defines exploratory research as research that assesses phenomena via a new conceptual lens (1993). Applying historical sociology and a socio-ecological systems approach to case studies within ecological economics is a new perspective. Exploratory research is meant to find and examine “the reasons for, or associations between, what exists” (Ritchie 2003, p 27) and to gain understanding of a context or situation to generate hypotheses, describe a subgroup of the population, or expose new themes within a case grouping (Palys and Atchison 2008). Case studies function as the most appropriate approach to exploratory research (Robson 1993). Case studies are suitable when attempting to understand variable social phenomena as researchers are able to spend time getting to know participants and understand important and fundamental knowledge that helps answer the research question. The objective of a case study is “not to find universal rules but to understand the case or cases deeply

in their own unique environment” and apply these lessons in generalizable ways that will be built on over time (ibid. p. 71). While there will be differences between various case studies on the same topic, every lesson learned either supports or refutes findings on the larger narrative of the case group, “consequently, the nature of the studied unit, its own way of acting and thinking, are important research findings in a case study” (ibid., p. 71).

Two core case studies are used in this dissertation – rural Makers in PEI and urban Makers in Southern Ontario – to help inform the resulting framework. Both case studies are examples of Makers in Canada that might present opportunities for imagining new forms of production and socio-economic relationships within the limits to growth discourse. I included a broad spectrum of Makers, not just those typically researched (i.e. the ones frequenting Maker Faires and spaces) such as entrepreneurs, preppers and homesteaders. I spent time becoming a part of the Maker community to understand the topic and the participants on a deeper level.

These case studies, alongside the literature from historical sociology, provides knowledge on what is important for inclusion in the EEDGs, which in turn helps ecological economists with imagining futures that considers the complexities between socio-ecological relationships.

Part 1: Background

In this section, I use literature reviews to define my theoretical approach to understanding the problem context that my case studies are in and how to best approach this problem. I use this framework to approach my central research question:

How can prefigurative communities of practice better inform systemic ecological economic approaches for cultural change and problem solving to maintain a progressive and high quality of life while remaining within limits of the biosphere?

To begin answering this research question, I explore three theoretical areas of literature:

- a. **Ecological Economics:** After introducing the important elements of ecological economics and a critique of where the discipline has gone, I argue for the prioritization of the cultural subsystem, oft ignored, as a central tenet in the development of a realistic green economic vision.
- b. **Socio-Ecological Systems Transformation and Theories of Social Change:** In Chapter 3, I introduce a set of disciplines that underpin my approach to understanding social change including behavioural economics, sociology, terror management and systems theories. These theories of social change explain the reasons why people do the things they do, how the context in which they do things has come to develop, and how we may be able to influence the system.
- c. **Problems with Change:** In Chapter 4, I question if we can continue to have a progressive, high-tech, and diverse lifestyle while being environmentally responsible. In doing so, I look for the kinds of trade-offs individuals may need to be willing to make to have a satisfying systems transformation. I use this later in Chapter 7 to explore whether changing

cultural dimensions to adhere to environmental limits to growth may have unintended consequences, such as decreased government taxes leading to less state funded social services.

2. Conceptual Framework

Motivation for this study emerges from a widely-recognized need to explore and understand socio-ecological opportunities for change that are both socially just and ecologically sustainable (Ahmed 2014; Botsman and Rogers 2010; Confino 2014; Ehrlich and Ehrlich 2013; Heinberg 2006; Pappas 2012; Schwartz and Nichols 2006). The ecological challenges facing upcoming generations require socially creative solutions that maintain historically progressive social achievements, such as women's rights, sexual liberation, freedom of speech, and diversity, while developing a radically new, and environmentally sustainable, political economy. Beyond the disastrous impacts the economy has on the environment (Blomqvist et al. 2013; Greer 2009, 2013; Heinberg 2010; Homer-Dixon 2007; Lin et al. 2015; Rockstrom et al. 2009; Pappas 2012), new economic processes are required for western society due to reduced availability of 'jobs for life' (meaning a permanent job with a pension and little fear of being easily downsized, laid off, or fired) (Bauman 2004; Beck 2000; Bradley and Devadason 2008; Bridge 2016; Collin and Young 2000, 23; Gandini 2016; Goodwin and O'Connor 2005), and a growing need for young people to navigate life with lower income than their parents, while still wanting to have a family and security (Barr and Zapponi n.d.; J. M. Henderson 2013; Malik, Barr, and Oltermann 2016; McGinnis Johnson and Ng 2016; Ward 2007; Worstall 2017).

Various discourses (Dryzek 2005; Quilley 2017) have attempted to grapple with this problem ranging from high tech ecological modernisation (Beggs 2009; Diamandis and Kotler 2012; Kaku 1998, 2009; Segal 2005) to economic and technological degrowth (Bauhardt 2014; D'Alisa, Demaria, and Kallis 2014; Kallis 2013; Kallis, Kerschner, and Martinez-Alier 2012; Nørgård 2013; Romano 2012; Sorman and Giampietro 2013). One discourse among this spectrum is ecological economics (Daly 2007; Jackson 2009; Victor 2008), which Quilley characterizes as a 'radically green optimistic' discourse for the future (Quilley 2017).

I situate my work and academic views within the broader context of ecological economics. The discourse starts from a premise of explicit limits to growth while utilizing systems thinking concepts such as subsystems, emergent properties, and feedback loops by “adopting an integrated, interdisciplinary, and holistic approach...”, while “at the same time [considering] the potential long-term consequence of current phenomena” (Kronenberg 2007, p. 79). Ecological economics is a useful starting framework as it asserts that the economy is embedded within social and ecological systems (Figure 3). Ecological economists attempt to develop solutions that respect this hierarchical system, which has largely been ignored by neoclassical economists.

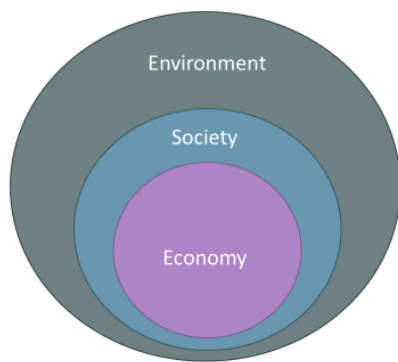


Figure 3: Nested systems of ecological economics

Ecological economics is a broad field with various approaches to knowledge generation such as: modeling to explore feedback cycles and possible policy impacts over time (Upward 2012; Victor 2008); energy economics, which utilizes thermodynamics and net energy gains (Ayres 1998; Hirth 2013; Kilian 2016; Newbery 2016; Howard T. Odum 2007; Howard T Odum and Odum 2001); and ecosystem service evaluation (Alam, Dupras, and Messier 2016; Dupras and Alam 2015; Newell 2016).

The various approaches within ecological economics all have their benefits and limitations (Gómez-Baggethun and Muradian 2015; Joan Martinez-Alier, Munda, and O'Neill

1998; Spash 2013). For the most part, I leave most of these approaches aside and focus on ‘macro-social ecological economics’ which seeks to find large patterns of opportunity for dealing with the cycles of socio-ecological and socio-economic life over time and to develop visions of the future for ecological economic practice to work towards. I broadly critique approaches within ecological economics, mainly in their lackluster attempts at including the social sphere in their analysis, the sphere most vital for developing such visions. While many are interested in ensuring we have an economy that fits within the biosphere, they often ignore the question of whether it will also fit within the social sphere. As a response to this critique, I present a reconfigured ecological economic framework of Daly’s initial ecological economics argument, which explicates social and cultural dimensions for local economic change.

While ‘society’ and ‘culture’ are already an explicit part of the ecological economic framework, they are often ignored by practitioners and theorists. In this chapter I provide evidence for this assertion by presenting an overview of how various ecological economists approach the topic of culture and society. I then provide a framework for ensuring future inclusion of what I call the ecological economic ‘social sphere’, in Chapter 7.

2.1. Ecological Economics

Spash argues that ecological economics partially grew out of the ineffectiveness and lack of creative approach in environmental and natural resource economics (1999). In the 1960s and 70s Western environmental regulation became a regular dimension of economic governance. Countries banned harmful chemicals and toxic substances and made international agreements for environmental protection such as regulating oil tankers and limiting ozone depleting substances. However, the following the Thatcher and Reagan era, characterised by increasing neo-liberalism, saw environmental concerns drop off the political radar. At the same time, major environmental

problems began to ramp up (such as o-zone depletion, deforestation, ocean acidification) while environmental economics (an established discipline) excluded important critiques and alternative approaches to sustainability economics (such as: Meadows et al. 1972; Schumacher 1973).

Beginning in the mid-1980s, seminal literature in ecological economics offered a new approach to sustainability economics (Cleveland et al. 1984; Georgescu-Roegen 1975; Costanza 1989; Costanza, Daly, and Bartholomew 1991; Costanza et al. 1997; Juan Martinez-Alier and Schlüpmann 1987; H.T Odum, Brown, and Costanza 1976). This emerging field combined insights from Polanyi (1944) and Kapp (1950) on the social costs of capitalism, Boulding (1966; 1970) and Daly (1977) on ideas from system dynamics, Odum (1976) and Georgescu-Roegen (1975) on thermodynamics, and called for interdisciplinary thinking within ecology and sociology. The International Society for Ecological Economics was founded in 1989, along with the Journal of Ecological Economics. Ecological Economics set itself apart from neoclassical economics in several ways, as outline in Table 1, adapted from Gowdy and Erickson (2005).

A variety of disputed approaches notwithstanding, Ecological Economics is premised on three key ideas: 1) Scale – that we live on a finite planet and the economy is a subsystem of the metabolism of the biosphere that must operate within. I.e. ecological economics is a vision of social and economic constraint. 2) Fair distribution (equity), i.e. in the interest of both justice and political order any sustainable market economy requires a sound safety net and a stable institution for redistribution of excess finance. 3) Efficient allocation, i.e. all other things being equal there is no reliable alternative to market allocation as a driver of technological innovation and minimization of systemic waste.

Table 1: Neoclassical versus ecological economics

Conceptual Issue	Neoclassical welfare economics and environmental economics	Ecological economic alternative
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Fungibility	Reduce value to commensurable monetary units; utility function.	Separate value into incommensurable categories; multi-criteria assessment; embed market value with cultural/social contexts
The Rational Actor	Individual consumers and firms at the centre of analysis.	Analyse humans as social actors, consumers versus citizens.
Marginal Analysis	Comparative statics of marginal changes.	Recognises discontinuous change and total effects.
Evolutionary Change	Evolution as constrained optimisation, survival of the fittest view of market outcomes, individual based selection.	Importance of contingency, historical accidents, path dependency. Considers altruism and group selection as well as selfishness.
Uncertainty	Reduce uncertainty to risk. Market outcome focus to decision-making.	Precautionary principle to deal with pure uncertainty. Process-oriented, co-evolutionary focus to decision-making.
Decision Criteria	Efficiency as the sole criterion, usually based on potential Pareto improvements.	Equity, stability, resilience of environmental and social systems.
Production Process	Theory of allocation of fixed resources; production function.	Production as a biophysical process, thermodynamics; extended IO approach, joint production of goods and polluting wastes.
Discounting	Straight-line discounting of future costs and benefits.	Recognises the difference between individual and social valuation of the future; hyperbolic discounting.

Since the 1980s, various schools of thought have emerged within the discipline. Some approaches are more closely related to environmental economics and ecological modernisation while others are far more heterodox, such as those focusing on radical social change. Spash categorizes these (1999; 2017) as three schools of thought: 1) mainstream new resource economists (such as individuals who focus on modeling and ecosystem service analysis: Dupras and Alam 2015; Alam, et al. 2016; Victor 2008) 2) new environmental pragmatists (such as individuals who focus on approaches approved by mainstream capitalism: Dolter 2017; Jacobson 2012; Newbery 2016) and 3) radical social ecological economists (such as individuals who focus on undermining capitalism and recommending transformative social measures: Kallis, et al. 2012; Sorman and Giampietro 2013).

Table 2: A tentative vision for ecological economics (based on Spash)

Ontological Presuppositions	An objective reality exists independent of humans & humans create social reality
	Facts about social reality are inseparable from values
	Biophysical and social realities are distinct but are interconnected
	A hierarchical ontology is accepted in which there is an ordered structure
	Society and the individual are distinct in that the former cannot be reduced to the latter nor the latter merely aggregate to create the former
	Complex systems and their interactions create emergent properties and are inherently unpredictable
	Systems are continually subject to change and interaction
Epistemological Claims	Our scientific knowledge is always subject to strong uncertainty
	We can never prove that we have discovered the truth in our scientific understanding
	Understanding and interpreting reality are social processes in which knowledge is often contested
	Knowledge comes in different forms and is not the exclusive domain of the expert; indigenous and lay knowledge may challenge or complement expert knowledge
	Knowledge is subject to reasoned critique and empirical investigation
	Critique can take a variety of forms leading to the need for plural methods
	Advancing knowledge requires accepting and rejecting information and revising beliefs
Methodological Positions	Ecological economics is an interdisciplinary approach to understanding
	Successful interdisciplinarity requires integration having understood the ontological and epistemological basis for cooperation between different bodies of knowledge
	Unstructured methodological pluralism is the antithesis of creating knowledge
	Structured methodological pluralism requires working across fields of knowledge with those who share a common ontology and epistemology
	Creation of mutually understood concepts is necessary for interdisciplinary understanding
	Methods of evaluation must match the requirements of value pluralism
Ideological Beliefs	Ethical neutrality should be rejected and ethical positions made explicit
	Both human and non-human inhabitants of Earth are morally considerable
	Action is required to address gender inequity, and inequity between, within and across social groups, time periods and spatial dimensions
	There are more meaningful aspirations for human existence than hedonism (e.g. invoking philosophical concepts such as flourishing, a 'worthwhile life', the 'good-life')
	Restrictions are necessary on population growth and the scale of human activity
	Levels of material and energy consumption per capita prevalent in the industrialised world are excessive and its social and environmental consequences unacceptable
	Opposition is required to the wanton destruction of war and the military-industrial complex
	We should uphold democratic principles of fairness and justice, including international human rights and protection of the innocent from harm
	Ecological economics can change the world by creating better understanding of the structure of the social and environmental reality in which we live and communicating its findings to help achieve that change
	Ecological economists should act personally in ways consistent with their environmental and social values

Spash argues that this may be because there is no central and clear vision for ecological economists to follow, so he put forward a tentative vision for ecological economics (Table 2).

Spash does not, however, acknowledge the possibility that not all of these values and aspirations can in fact be reconciled simultaneously; an argument explored by Kish and Quilley (2017).



There is a new tendency for ecological economists to be cautious in recommending radical change (Sunstein 2005; Raffensperger and Tickner 1999). Recommendations tend to be too cautious or focused on micro-changes. For example, a recent issue of *the Journal of Ecological Economics* (as of May 5, 2017) covers topics of harvest of wild animals (Leão, Lobo, and Scotson 2017), a survey of agricultural pollution in China (Liu et al. 2017), waste disposal inconvenience in South Korea (M. Lee, Choi, and Koo 2017), more fish stock models (Cordier et

al. 2017), hydrologic insurance in Brazil (Mohor and Mendiondo 2017), and tourism in Spain (Carrillo and Jorge 2017). The Wordle in Figure 4 shows the most commonly used words in the *Journal of Ecological Economics* (JEE) from 1989 to 2015 (Arruda and Dolter 2016). The top 10 words used in JEE focus on reducing the impact on the environment through tools such as ecosystem services and ecosystem service evaluation (Figure 4; Table 3). These approaches deal with an important critique of neoclassical economics – that the environment has been an externality for far too long. But they do not question overarching structures of society or culture that have made this into economic reality.

Table 3: Top Canadian Ecological Economics Keywords
This table shows the keywords used most frequently in the JEE.

Keywords	Keyword Count	%	Cumulative %
1. Ecosystem services	10	1.11%	1.11%
2. Valuation	8	0.89%	2.00%
3. Conservation	8	0.89%	2.89%
4. Sustainability	8	0.89%	3.78%
5. Climate change	8	0.89%	4.67%
6. Environmental policy	5	0.56%	5.23%
7. Natural capital	5	0.56%	5.78%
8. Environmental Kuznets curve	5	0.56%	6.34%
9. Evaluation	4	0.44%	6.79%
10. Indicators	4	0.44%	7.23%
11. Sustainable development	4	0.44%	7.68%
12. Payment for Ecosystem Services	4	0.44%	8.12%

In his paper “The second generation of ecological economics: How far has the apple fallen from the tree?” Plumecocq (2014) tracks how ecological economics has changed over the years. He processed 6237 abstracts published in four journals from 1989 – 2014 to examine how ecological economic discourse has evolved. He concluded that ecological economics is well on its way to converging with environmental economics, especially given that ecosystem service

discourse has become central to ecological economics. This is supported by various others in the field (Gowdy and Erickson 2005; Illge and Schwarze 2009; Spash 2012).

Plumecocq found that from 1989-1999, the main focus of the discourse was on conceptualizing ecological economics and situating itself against neoclassical economics. From 2000-2002 scholars started trying to apply economic concepts to the newly established framework. In 2003-2005 the discourse shifts to a focus on biodiversity issues followed by a phase of methodological development in 2006-2007. Beginning in 2008, the functionalist approaches begin to appear starting with an increase in research on ‘willingness to pay’ in joint use with biophysical indicators such as the Ecological Footprint. While the concept of resilience emerges in 2013, the discourse is largely dominated by ecosystem service analysis. Plumecocq begins his discussion saying: “Results drawn from textual analysis seem to indicate (i) a tendency of EE to move closer to the discourse produced in the field of environmental economics, and (ii) the co-emergence of the notion of ecosystem services on the one hand, and the resort to monetary valuation techniques on the other hand”. He blames this on the communities’ attempt to garner attention from mainstream economists which was a conscious strategy in 2004 (Røpke 2005). This strategy involved the intentional refocusing of editorial policy among major ecological economics journals and a shift in perspective of the most influential ecological economist, Robert Costanza (who really is the most influential ecological economist (Costanza et al. 2016)). Plumecocq recounts Costanza’s career:

“His supervisor was Howard T. Odum, a complex system ecologist who applied entropy flow to account for the energy appropriation of systems. Costanza's early works were in line with energy analysis, but slowly evolved to ecosystem service and monetary valuation a significant turning point. The congruence of these two trajectories indicates the influence Costanza had and still seems to have over the editorial choices of EE, and more broadly, on the field.”

Norgaard and Costanza make a deliberate effort to increase pluralistic and pragmatic approaches in ecological economics – characteristic of Spash’s New Environmental Pragmatism: “the most important role for research is to be pragmatic and employ whatever approaches are effective to inform the policy community about environmental problems and their solution” (Spash and Ryan 2012, p. 1101).

I am not disparaging this work or the importance of topics such as ecosystem service analysis, environmental valuation, policy innovations, and the other topics highlighted in Figure 4. These are important topics used to understand the world around us. It is when these topics are contrasted against the foundational vision for ecological economics, specifically in their exclusion of cultural elements, that these discussions fall short. These topics are overwhelming the field, so a great deal of the passion or critical edge that the discipline may have once had has largely disappeared.

Spash claims that despite developing as a response to environmental economics, ecological economic scholars often use resource and environmental economic tools for problem solving (2013). While there is room for these approaches within a larger umbrella of environmental science, its takes the novelty away from ecological economics. Spash argues that, “the prevalence of the tools and methods of resource and environmental economics within ecological economics is not something to celebrate. Indeed, from a heterodox economic perspective, this is just another case of territorial annexation by the mainstream ... This is just how the political battles within economics operate and how, until now, the non-conformist minority of blasphemous economists has been overridden by the conformist majority” (p. 205); an argument that has characterized Spash’s work for years (1999; 2012, 2013; 2017). This focus

on the tools of ecological economics directly relates to the deterioration of critical edge that ecological economics was founded on.

Despite undermining critical and necessary commitments to radical cultural change needed for ecological economics, these approaches are still used because they are meant to avoid alienating mainstream politics and funding agencies. This became more prevalent in the field after Norgaard (1989) argued for methodological pluralism in ecological economics due to the complex nature of the problems faced in the field. By acknowledging the existence of many economic frameworks, methodological pluralism is meant to show tolerance to other methodologies.

While Norgaard is critical of neoclassical economics he argues that such approaches should be included in ecological economic discourse due to its pervasiveness in policy. Costanza echoes this, that pluralism is required since no one approach can adequately deal with the complexity of problems:

“In studying the relationships between ecosystems and economic systems a large measure of “conceptual pluralism” is warranted. There is probably not one *right* approach or paradigm, because, like the blind men and the elephant, the subject is too big and complex to touch it all with one limited set of conceptual tools. The Journal will therefore pursue a strategy of pluralism.”

(Costanza 1989, p.2)

Costanza’s approach here is not to say that we must incorporate neoclassical economics. It is that we should do whatever we can to solve the problems. He claims that ecological economists should use neoclassical tools when warranted, without discussion as to what “when warranted” means.

This methodological pluralism is problematic given that on the one hand neoclassical economists view the economic system as comprised of consumers and the environment as externalities while on the other hand ecological economists take a holistic and systemic approach

putting the biosphere at the very centre of their theory. This creates opportunity for great methodological incoherence, characteristic of what we see in ecological economics today. When attending ecological economic conferences and reading the EE Journal individuals should be presented with holistic approaches to problem solving. Instead conferences and the EE journal, are over-saturated with functionalist approaches, further perpetuating the idea that methodological pluralism is okay, allowing non-ecological economic research to begin overwhelming these channels for dissemination. Spash argues that this methodological pluralism limits advancements for ecological economics and creates a barrier in the field for adopting a clear ontological framework that ecological economists can define themselves under (referencing back to Table 2).

This isn't where ecological economics started. In *For the Common Good*, Daly (1989) very clearly prioritizes communitarian values over all else. Daly quotes Polanyi who notes that "in a capitalist society instead of economy being embedded in social relations, social relations are embedded in the economic system" (1944 p. 57). Daly says that "it is this reversal that an economics for community cannot tolerate" (1989 p. 8). He argues that we can keep the insights we have learned from individualistic terms and apply these from the viewpoint of person-in-community. This is where Daly left room for functionalist and neoclassical economics to creep back in. He argues that the analysis of the market can continue when the economy is a service of community (p. 19), but really, we can't because it wouldn't be a 'market'. Rather, we would be answering to, and responding to, 'life'. In using neoclassical terminology, he left the purpose of ecological economics up to functionalist interpretations. The point here is that Daly meant for ecological economics to have a central focus on community.

Farley, Erickson, and Daly argue, “It is essential to explicitly distinguish between the economy and the political structures, cultures, institutions and norms of society” (Farley, Erickson, and Daly 2004, 194) . They argue that changing the goal of the system and inciting paradigm shifts are the most effective ways of creating large-scale and long-term change and recognizing the value of focusing on “drivers of change” (Farley, Erickson, and Daly 2004, 127). In 2011, Daly and Farley “call for a return to the beginnings of economics as a moral philosophy explicitly directed toward raising the quality of life of this and future generations” and while they recognize the difficulty in that process they inspiringly claim that “when faced with the unhappy dilemma of choosing between a physical and a political impossibility, it is better to attempt the politically impossible” (p. xxvii).

The impossibility of this transition is stark. During the Great Acceleration, many social (human rights, animal rights, sexual liberation, education), economic (GDP, land ownership, travel) and environmental (CO₂, ocean acidification) indicators saw exponential growth which suggests that these processes are tied potentially together; asking again the question if the SDGs and Ecological Footprint are compatible. The Polanyian re-embedding intimated by Daly potentially challenges a lot of taken for granted social norms that would come into question because the scale of the economy may need to contract so much that we would lose some state welfare safety nets, progressive and complex divorce laws, and individual mobility (travel, moving for school, leaving small communities) (Quilley 2013). This problem represents a fundamental tension between the basic pillars of ecological economics that students of the Economics for the Anthropocene (E4A) are struggling to deal with, as observed at their Winter 2018 retreat.

The E4A project, related books (Brown 2012; Brown and Timmerman 2015), and emerging Leadership for the Ecozoic project are all indications that at least some ecological economists are hearing the call from Daly and Farley to reignite the initial passion of the discipline. The projects focus on the multifaceted nature of ecological economics, training students to think in broader thought categories and longer time frames to shift the unit of analysis in their work. However, their projects and work would benefit from the inclusion of a systems perspective to deal with issues of cross scale change, systems transitions, and unintended consequences of degrowth – all of which seems to be missing from their discourse.

Resilience theory is an underlying principle within ecological economics, which emphasises system changes (Berkes, Colding, and Folke 2008; Gunderson and Holling 2001). These functionalist approaches within ecological economists tend to avoid thinking about collapse and renewal cycles. Instead, there is a tendency to focus on sustainability of the system, rather than discussing adaptability and new system phases; they are relying on fail-safe approaches through adaptive management strategies and tools. This is the role of environmental economics, not ecological economics; ecological economists need to internalize the ‘long-view’ of the current situation and embrace, or at least prepare for/think about, transition. Instead of focusing on resource stocks and renewable energy strategies, ecological economists need to be thinking about the renewal phase of the adaptive cycle (explored later in section 3.4.) – that is, on what comes after the collapse of the mainstream economic system that exists now, or how we might influence a transition if that threshold is not crossed naturally. Many ecological economic narratives attempt to deliver the same kind of mass appeal that sustainable development once did – a responsible way into the future without losing a significant amount of modern comfort and development, especially those focused on energy transitions (Beggs 2009; Dolter 2017; Jacobson

2012; Newbery 2016). But ecological economics was founded on the idea of being a visionary discipline for future possibilities, not clinging to the old.

In general, ecological economists could argue that several of their research areas include society within them. They wouldn't be wrong. However: there is very little that focuses on what a sustainable society might look like and how the economy might fit into that. For example, it is the relationship between work and society that should be the focus rather than commute times. It is much more common for an ecological economist to research the value one places on the environment and general opinions regarding nature and then to argue that the economy should reflect that through tools such as ecosystem services and cultural capital. It is a subtle but important difference. The former places society as a central tenet for shaping the economy and the latter uses existing economic systems to measure how society values their environment. The ecological economic principle of scale in relation to the economy as a subsystem of society and culture needs to be taken more seriously. Ecological economists need to determine what a 'healthy' social system is with respect to the environment, and how the economy should service that. They need also to work with a much wider range of academic disciplines and spiritual perspectives to work out what the options might be and recognize the difficulties in separating these from environmental problems. I will present further evidence of this in the following section, 2.1.2.

It is worth mentioning that degrowth discourse tends to contribute to the radical conversations in ecological economics. Kallis, et al. (2012) argue that degrowth "advocates have a different vision of prosperity, one based on dramatically less material abundance and consumption. They are less afraid of hair shirts, so to speak...". They go on to point out that upscaling voluntary simplicity is difficult, and an ethical grey area because "...some voluntary

downshifters do not mind such hardship. But these are typically people who had a choice between simplicity and meaningless affluence. It does not follow that others, such as those who never had the choice, or those that enjoy their power, will not mind either.” Degrowth scholars within ecological economics are more likely to suggest socially radical and heterodox approaches (Bauhardt 2014; Brownhill, Turner, and Kaara 2012; D’Alisa and Cattaneo 2013; Joutsenvirta 2016; Kallis, Kerschner, and Martinez-Alier 2012; Kallis 2013; Lorek and Fuchs 2013).

2.1.2. The Forgotten Sphere

Cap and share, zero interest rates, new forms of property, and work-sharing are important factors of a new ecological economy, but we also need to focus on what would support a healthy social sphere. Some ecological economists will argue that in countries like Canada, our economy needs to be based on improving quality of life rather than focusing on growth (Cattaneo et al. 2012; D’Alisa, Demaria, and Kallis 2014; Kallis, Kerschner, and Martinez-Alier 2012). While there are ideas in ecological economics on how to do this, it is not the focus and hasn’t garnered much attention as of late. Ecological economists must stop ignoring the third sphere of their basic framework.

While culture is an explicit part of the ecological economic framework, it is either overlooked or an afterthought. In this section I explore ways ecological economists do or do not incorporate culture in their research. In 1874, Tylor, who is credited with launching the discipline of anthropology, defined culture as “that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habit acquired by man [sic] as a member of society” (1874, 1). I use this definition for my thesis, while also using various understandings from sociology to engage with ‘culture’ such as Marx’s idea of the

base/superstructure and lessons from Giddens, Beck, and Bauman on the implications of modernity on social well-being.

An ecological economist will almost certainly be willing to suggest that an economic activity is encroaching on the biosphere, but they are less likely to suggest that a particular economic activity might be encroaching on the social sphere; there is little analysis on how economic activity is detrimental to the well-being of individuals – the direct relationships between the social and economic spheres. This is partially because it is difficult to account for society in economic modeling, but also because economists lack a clear definition of what a sustainable society entails. Ecological economists take for granted that modern liberal-democratic society is, or at least can be, synonymous with a sustainable economy. I suggest that they don't only need to envision a future with a radically different economy, but also with a radically different society, and be explicit about what this looks like. It behooves ecological economists to be more vocal in the unsustainable characteristics of society and clearly establish the boundaries and characteristics of what a healthy social sphere looks like.

Current approaches to the social sphere can be broken down into three categories (Table 4): a) superficial inclusion, b) parallel inclusions, and c) central inclusion. Daly is absent from this table as he represents a more complex approach to this – he is situated within all three of these categories and therefore a core piece of my proposed solution and framework, along side Polanyi, Ophuls, and complex systems thinkers. The table is not an exhaustive list of those who would be found in each of these categories – rather those in the table are exemplary of the category and therefore useful for conceptualizing the boundaries and characteristics of each classification.

Table 4: Approaches to inclusion of the social sphere

<u>Classification</u>	<u>Examples of tools, methods, and approaches</u>	<u>Scholars and Economists</u>	<u>Comments and critiques</u>
Superficial inclusion <i>Typically, more classical economic approaches, use tools introduced in Keynesian and environmental economics.</i>	Natural and Cultural Capital	Berkes and Folke (2000)	Argue we need to ensure cultural capacity for adaptation rather than adapting the economy for a healthy culture
	Modeling	Victor (2008)	Shows how stocks and flows of resources and economic systems function in a reductive manner that ignores cultural dynamics
	Willingness to Pay	Johansson-Stenman (1998)	Individual motivations Reduces cultural place-based meaning to economic monetary value
Parallel inclusion <i>Progressive methodologies that are still inherently capitalist in their approaches.</i>	Coevolution	Kallis, Norgaard (2010)	Demonstrate interconnection but not what a healthy society might be
	Include unpaid work in GDP	O'Neill and Fanning (1997; 2017)	'Measuring' culture to be included in a metric for how well a country is doing
	Cultural Ecosystem Services	Costanza (1997); Ostrom (2007)	Recognize the cultural value of ecosystems but not the value of culture for ecosystems
	Develop an ecosystem identity	Kumar and Kumar (2007) Zavestoski (2004), Ostrom (1999)	Introduces the need for an ecosystem identity without indication on how to scale it up or to bolster such a culture
Central inclusion <i>Radical eco-cultural approaches that put culture and society at the center for their economic approach.</i>	K-Modernity	Quilley (2017)	A new rendition of 'the third way' using sociological history and systems thinking that engages seriously with a possibility for a reembedded economy
	Social Ecological Economics	Spash (2013)	Argues for ecological economic approaches that are heterodox in nature. Put forward Social Ecological Economics (SEE)
	Deep ecological economics	Naess (1990)	Includes ecofeminism and voices of those marginalised without clear steps for application

a) Superficial inclusion

Most ecological economists will, at a minimum, pay lip service to society and culture in their work. This is better than traditional economists, who have no obligation beyond the market. But, in regard to the ecological economists, these perfunctory attempts at including the social sphere

tend to ignore the complex dynamics of culture, see culture and society as tools for adapting to a changing economy (as opposed to the other way around), and reduce cultural meaning to a monetary or numeric value.

A good example of this are those who research a community's or individual's willingness to pay (WTP) for an ecosystem service. Several scholars examine the motivations and culture around WTP (Haab and McConnell 1997; Johansson-Stenman 1998; Martín-López, Montes, and Benayas 2007; Pate and Loomis 1997). An example of this is calculating what the maximum price an individual is willing to pay for entrance into a national park. These scholars underplay or ignore culture as a vehicle for political and behavioural change instead using it as a tool for rationalisation for policy and governance strategies. This type of social inclusion is a focus on individual motivations, rather than societal, cultural, or group dynamics.

Freeman argues that “society should make changes in environmental resource allocation only if the results are worth more in terms of individuals' welfare than what is given up by diverting resources and inputs from other uses” (1998, 7). This focus on the individual is a progressive liberal habit of mind that implicitly maintains the system that upholds the sovereignty of the individual (the same system that ecological economists should potentially be attempting to undermine) (Kish and Quilley 2017; Quilley 2017). The kinds of changes that may be required would see the individual as a single part of a cohesive unit, not as an individual unit for analysis (Quilley 2013; 2017), more in line with Daly's original argument that the most important factor for well-being is a communitarian way of living.

Another example is ‘natural capital’ and ecosystem services, which map how people use the environment (Raymond et al. 2009). Berkes and Folke use an extension of this concept, ‘cultural capital’ originally popularised by Bourdieu (2005). Cultural capital includes “factors

that provide human societies with the means and adaptations to deal with the natural environment” and “...refers to factors that provide human societies with the means and adaptations to deal with the natural environment and to actively modify it” (Berkes and Folke 2000, p. 128, p. 130). This includes social and political institutions, ethics, and traditional ecological knowledge (TEK). Here we find that the function of culture is not to be the unit of analysis or to contribute to the well-being of citizens, but to maintain the economy by ensuring cultural capacity for adaptation to future needs. TEK is interesting and a bit out of place here. While TEK is based in indigenous thought and requires a degree of intergenerational continuity and place-bounded knowledge – it is sometimes co-opted and used by ecological economic scholars as a way to culturize their rationalist approaches (Berkes and Folke 2000; Huntington 2000; Martin et al. 2010).

A common tool for ecological economists is system modeling. System modeling is a broad category in which most practitioners ignore culture as it is difficult, if not impossible, to include cultural behaviour in an economic model. This habit comes from ecological economics’ theoretical history in systems sciences and hard system dynamics. For example, Victor primarily focuses on modeling stocks and flows within economies. This is important for seeing how resources change over time. His theoretical work refers to social issues we may typically find in a macroeconomic analysis, such as inequalities between nations, high levels of employment, equity, and income distribution (2008). In his newer work with Tim Jackson (2014), he goes on to state that modelling the transition to a sustainable economy must include the distribution of incomes, wealth, and wellbeing. To do so he offers two approaches, one of which is a new Keynesian model which describes an adjustment path along an equilibrium. The model links 59 industries and consumption of five household income groups within 47 consumption categories.

In this model, consumers maximize current discounted value and service of expected utilities from consumption of goods. It accounts for past savings, future income, and public-sector taxes and transfers. It does not account for any cultural changes, behaviours, or preferences. The approach offers a stock-flow consistent system dynamics framework, which draws on a) ecological constraints on the economy, b) production, consumption, employment and public finances, and c) monetary flows within institutions and individuals. Neither of these attempts at modeling includes any cultural dynamics or ontology, discussions of a healthy society, or of the role that individual behaviour change plays in developing a vision for ecological economics. Instead, the models are reductive and present a narrow vision of an ecological economy and are culturally contradictory to what is needed to meet their own objectives of change.

b) Parallel inclusion

Ecological Economists who take a paralleled approach represent the largest category for socio-economic thinking. These economists tend to include the social sphere, without making it the central focus for change or analysis. A common example of this are those who want to see unpaid work included in the GDP or overall economic measurement of society (Dietz, O'Neill, and Daly 2012).

Referencing the 2008 financial crisis Nicolas Sarkozy, former French president, said “a great revolution is waiting for us, for years, people said that finance was a formidable creator of wealth, only to discover one day that it accumulated so many risks that the world almost plunged into chaos” (Søraker et al. 2014, 207). He went on to argue that reliance on GDP as the primary statistic for policy creation was a major underlying factor and that the aftermath of the 2008 crisis “obliges us to” think of alternatives. This call for a reimagining was part of a commissioned report to Joseph Stiglitz and Amartya Sen’s team that was critiquing GDP. Their

report starts “There is no single indicator that can capture something as complex as our society. But because what we choose to measure and how we construct our measures can have such an important role in the decisions that are made, it is important that there be an open and public discussion of our systems of metrics” (Fitouss, Sen, and Stiglitz 2011, xxx). What they are alluding to is what Jeroen van den Bergh refers to as the “GDP paradox: the fact that it’s widely proven and accepted that Gross Domestic Product...is not a good indicator of progress, and yet society is unable to let it go” (van den Bergh 2017, p. 22–23). Van den Bergh’s alternative is what he calls ‘agrowth’, the aim of which is “to let go of economic growth as a sufficient and even necessary condition for realizing welfare, and instead take a rational approach to public decision-making...As a society, we need to realize that growth fetishism is a constraint on our search for human progress” (ibid, p. 23). While I agree with van den Bergh’s overarching assessment of GDP, the parameters of his agrowth focus primarily on prioritizing net individual well-being.

A few of the more prominent ecological economists are proponents of coevolutionary ecological economics (Kallis and Norgaard 2010). Coevolution attempts to overcome the dualism of culture and ecosystems by proposing that societies coevolved with ecosystems, and thus, that culture and ecology are intimately tied. This theory is closely linked to the foundational ecological economic work by Daly and Georgescu-Roegen (1977; 1975). This approach recognizes the interconnectedness of the various spheres in ecological economics and that the relationship between society and the environment is reciprocal. However, it still lacks a methodological approach and clear view for what kinds of social parameters would be important to maintain a healthy biosphere.

Cultural ecosystem services are the non-material values associated with ecosystems. Costanza et al. expanded on this defining cultural services as the “aesthetic, artistic, educational, spiritual, and/or scientific values of ecosystems” (1997, 254). In 2005, this was further expanded on by the Millennium Ecosystem Assessment to include “the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience” (pp. 10-11). While including the value that ecosystems provide to culture is important, this approach still does not consider the value that culture can provide to ecosystems and the economy or explore the lack of fungibility of the services.

Satz et al. critique the above approach to ecological economics:

“There are many things which people understandably resist pricing or trading: treasured landscapes; love and friendship; religious conviction; aesthetic beauty. Yet, these goods play central roles in our lives, and we implicitly make decisions based on their relative value to us” (2013).

They go on to say that natural and social scientists need to ensure they do not exclude these considerations in assessments and deliberations of ecological economic policy. In the end, they still argue that we can place value on these things, that while “cultural values are intangible, we can design ways to deal with the problem of overcounting them” and that “some cultural values can be more or less adequately captured in economics terms” such as recreation (ibid).

In 2008, Kumar and Kumar argued that the valuation of ecosystem services has yet to evolve in a way that could capture socio-psychological dimensions of value. Rather, valuation methodologies utilize individual preferences to attempt to come up with a consensus on societal value for indicators of ecosystem health and scarcity. To counter this they offer a critique of ecosystem valuation that they themselves say “runs the risk of appearing so generic that it can sweepingly be applied to valuation of anything like cultural heritage, historical monument [sic]” (2008, 817). They go on to argue that within economics “... processes such as reciprocity,

relational, ecological identity etc. will also have to be considered as gestures, values, attitudes, modes of behavior that people engage with in voicing their concern and dependence on ecosystem services alongside the more utilitarian and anthropocentric reductionism employed by economists in valuation of ecosystem services” (818).

The heart of the matter is that mainstream economic discourses focus too squarely on contractual transaction; only by introducing a culture of reciprocity can social values begin to play a more critical role in society. To do this, economists need to move away from rational choice models to focus on culture and memory¹ – through this we can see both the intrinsic value of the ecosystem and its effects on human health and social structures (Connerton 1989; Polanyi 1944, 1957, 1971).

Viewed through rational choice or modeling, these ideas within valuation become less important. In other disciplines with similar structural discontent there is a strong critique of positivist structures of thought drowning out marginalized discourses (see: ecofeminism, cultural anthropology, and indigenous methodologies), but little of this exists in ecological economics. There is a difficult tension here in calling for more of these critiques in ecological economics. Mainly that feminist perspectives are committed to individual rights-based narratives. Indigenous critiques have less of this Enlightenment-derived ontology of freedom and commit less to the sanctity of the individual but is a critique relevant for a specific portion of the population. An indigenous critique could contribute a great deal to pre-capitalist modes of thought. However: a great deal of that conversation would be framed within a capitalist orientation. This takes us back

¹ I don’t explore the theme of cultural memory at any length. However, there is an argument to be made that memory can function to counteract some of the nonlinear problems of change. In his book, *How Societies Remember*, Paul Connerton argues that our social memory is robust enough to maintain progressive changes over long periods of time – this is why democracy has prevailed despite the repeated collapse of democratic societies. Our social memory is both a problem (makes it difficult to institute new approaches to politics and culture) but also important (specifically in relation to something like TEK).

to the heart of Polanyi's critique of economics, i.e. this paralleled approach only makes sense in a modern economy and society of individuals where their relational clusters have already been disembedded and split up.

To counteract this, Kumar and Kumar suggest looking at an 'ecosystem identity', as one of many indices, to find true valuation (2008). This is bolstered through a) identification with nature, and b) personal identity. Ecosystem service valuation "functions as a system of cultural projection of the forms of relationship between humans and the environment, reflecting the perceived realities, worldviews, mindsets and belief systems" (Nunes, Kumar, and Dedeurwaerdere 2014, 290). Kumar and Kumar argue that the best way to increase this valuation is to build ecologically based worldviews automatically through childhood and social development, infusing one's idea of nature in socially normative ways. Therefore, the whole culture needs an appropriate view of nature, not just one person. Personal ecological identity builds from this. It is the amalgamation of multiple personal identities associated with memory and language, steeped in nature given the culture would have more relation to nature.

Until this point, Kumar and Kumar presented a strong case for an ecological identity. I question their argument that historical processes that developed the state-citizen relationship is also a sufficient method for developing a human-nature relationship. Their views are also "not formulated in a way that allows them to be operationalized in ecosystem service valuation exercises" (Nunes, Kumar, and Dedeurwaerdere 2014, 290) but could be an effective way to ensure non-market based valuation was implicit in the culture. However: there is an assumption that if enough individuals create ecological identities, then a corresponding ecological culture will emerge. They do not discuss the barriers or difficulties in doing this or recognize the highly resilient culture of consumerism. More problematically, they go on to say that "...an ecological

identity provides an individual with the ability to connect her or his social behavior to its environmental impacts” (218) and discuss using it in conjunction with other ways of knowing, such as indigenous methodologies, for management and problem solving. Despite arguing for a strong ecological identity within culture, it is to assess environmental impact and to work toward management and problem solving. They are taking a passive stance on paradigm shifts; rather than actively arguing for such radical change.

c) Central inclusion

Finally, there are those that put culture and society at the centre of their approach and/or analysis.

Quilley uses the term ‘k-modernity’ to suggest that a completely new modernity is required for environmental protection (Quilley 2017). The ‘k’ refers to the re-organization phase in resilience, which follows a collapse phase of the system (this cycle is explained in more detail in section 3.4). Quilley argues that the economy in a re-organization phase must be based on a gifting and livelihood economy – which is an economy engrained in family and kin relationships, greater dependence on community, and is rooted in place-bound networks. It would be less likely that individuals would get caught up in their need for personal identity and would feel satisfied as part of their community (Donnellan, Trzesniewski, and Robins 2009; Twenge 2010a; Twenge and Foster 2008; Waugaman 2011)). There are some issues with k-modernity. Mainly that it may have similar characteristics to a feudal economy (which Daly cites as being a good thing 1990 p. 10) and Quilley offers no suggestions on how to bring progressive social movements forward into this new modernity, or how it might avoid rampant out-group antagonism, as seen throughout history.

Quilley does, however, recognize these tensions and that there will be trade-offs without offering any avenues for possible evolutions of our existing system. For example, while Quilley

suggests that the reduction of tax transfers could result in fewer social services impacting the emancipation of one family member from the constraints of domestic life, he does not explore alternative financialization strategies, potentialities emerging from ‘memory’ literature, or redistributive practices. His solutions are centered on the development of shared ontology and hero projects (from Becker 1973, explored in more detail in section 3.3) and yet he offers few suggestions for methods on mass ontological development especially given the pervasiveness and mass appeal of consumable goods. Quilley’s vision is appealing and offers a plethora of specific characteristics that would be ideal but there is little methodology offered to assist in the fruition of his imagined world or how we might begin to introduce these approaches in ecological economics.

Naess uses the term ‘deep ecological economics’ to discuss a new approach to ecological economics that is more philosophical and culture oriented (Naess 1990; 1986). Naess is careful to point out that the practice of deep ecological economics is separate from mystical and spiritual overtones. This is one of the biggest problems of his work – he attempts to maintain a rationalized approach to something that is essentially irrational. He emphasizes ethical conduct and environmental values as primary indicators and motivators for economic wellbeing. His primary concern is about human alienation and domination over nature, and how this is built into a patriarchal society. Naess suggests that this mode of dominance be completely dismantled – that any capitalist culture will inherently oppress anyone who is not in control. However, where Quilley offers a plethora of specific characteristics, Naess offers very few. The dismantling of the capitalist system and a path toward de-alienation are the only two ideals he puts forward. None of his suggestions can be applied to a framework for ensuring a truly ecological economic approach.

Finally, Spash developed ‘social ecological economics’ (SEE) as part of his framework for understanding various approaches within ecological economics, shown in Figure 5 (Spash 2013). He separates ecological economists into two camps, heterodox and orthodox, and then three approaches among those including a) new resource economists, b) new environmental pragmatists, and c) social ecological economics.

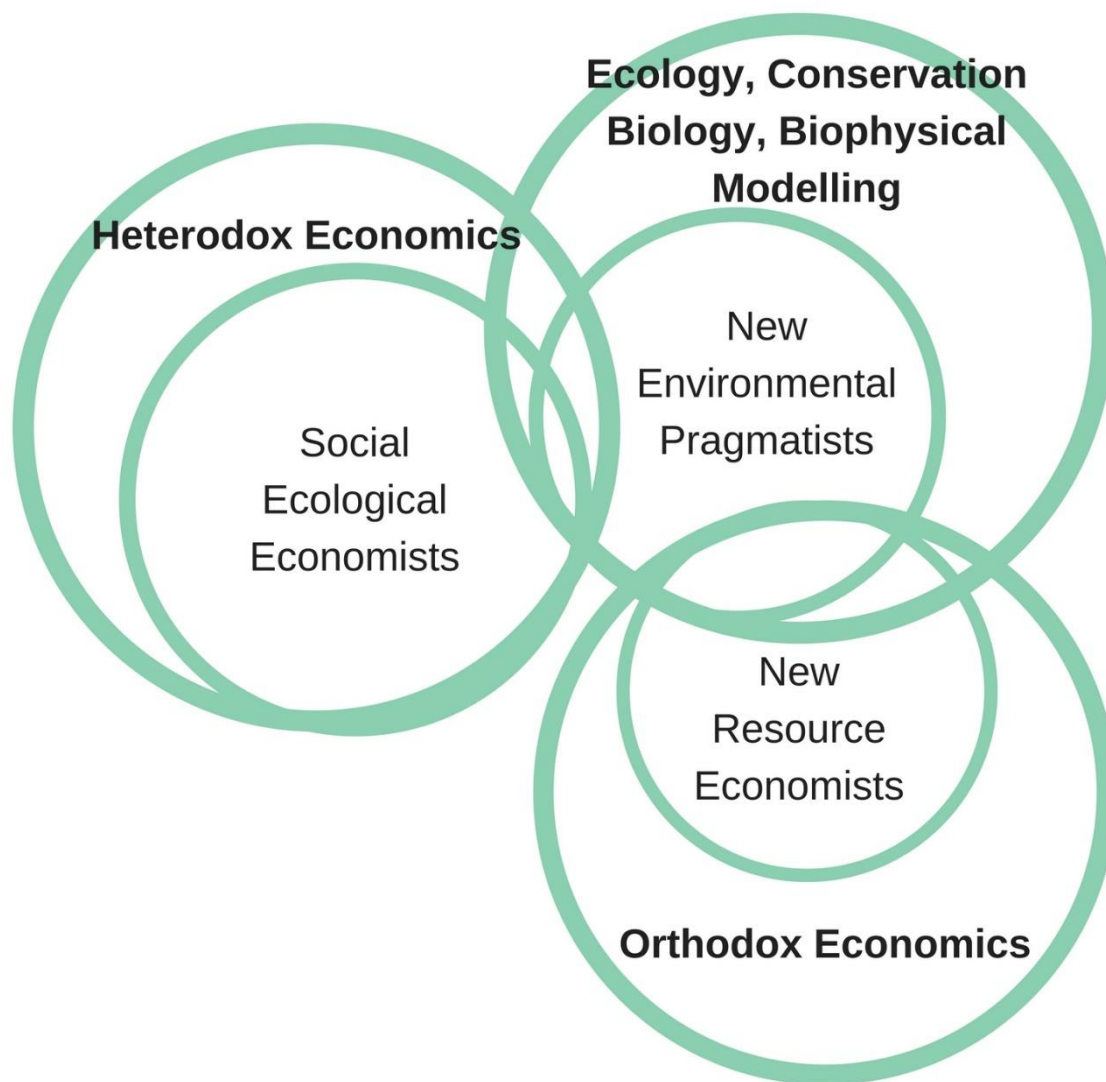


Figure 5: The heterodox vs. orthodox divide in ecological economics – adapted from Spash 2012

New resource economists are those who see ecological economics as nothing more than a sub-field of neoclassical economics – this is equivalent to my category of those who ignore culture. New environmental pragmatists are those who are focused on methods and concepts deemed effective under the current political climate and within capitalism.

Environmental pragmatists are similar to my category of those who have paralleled inclusion, but less generous to their attempts at including culture. They seek to sell an environmental message that is marketable to existing political and financial elites. They use concepts such as ecosystem service valuation, natural capital, green accounting, and carbon trading.

Social ecological economists aim to address the role of ideology, consumer sovereignty, corporate structure, and power politics. They call for a radical revolution in economic theory and a change in basic assumptions. They accept that the world works in cycles, and emphasise the importance of co-evolution of social, economic, technical, and natural systems using complexity and the concept of emergent properties. They are skeptical of models and any attempt to approximate future world states. Spash has expanded on SEE in other publications (Spash 2013; 2017). These definitions of various ecological economists are very useful and make for a useful way to critique existing ecological economic work. However, Spash also offers very few ways to ensure culture and society are applied to ecological economic policy (referencing back to Table 2).

If ecological economists are to begin including culture and society as central tenets in ecological economic policy development and theories, we need a framework for defining what this might look like. This challenge is addressed in Chapter 7.

3. Theories of Social Change

In this chapter I outline the theories of social change used throughout my research to inform my approach to the real-world applications of my research outcomes. The primary theories of social change that inform my dissertation include: a) behavioural economics, b) sociology and psychology of radical change, and c) resilience theory and transitions.

3.1. Behavioural Economics

In standard economics the individual consumer is thought of as a rational unit for analysis, who makes one-dimensional consumer decisions based on minimum cost and maximum effect. In real life, humans are complex. They don't always make optimum decisions because they weigh risks and make mistakes. Behavioural economics is an attempt to deal with the issues of a complex individual, and is the study of how people make decisions, why the individual does not always act selfishly, and why someone might make an economically disadvantageous decision (Camerer and Lowenstein 2004). Behavioural economics signifies the unifications between economics and psychology. Behavioural economics is centered on the idea that:

“the conviction according to which an increased realism of the psychological bases of economic analysis will improve the economic field in its terms – by generating theoretical perspectives, by developing better predictions of actual realities and by suggesting more appropriate policies.”

(Camerer and Lowenstein 2004, p. 3)

Behavioural economists have found several factors that influence a person's decision-making patterns: people are afraid and want to avoid loss or regret (Ariely 2010), people are influenced substantially by their peers (Slovic 1995), preference for immediate satisfaction (Kahneman et al 1990), and emotional confusion (Kahneman and Tversky 1979).

Research in behavioural economics can be classified in two categories: 1) the process of judgement and 2) the process of choice (Kahneman and Frederick 2002; Rabin and Schrag 1999). The process of judgement is influenced by experience, environment/context and risk aversion. The process of choice is influenced by an individual's evaluation of the product or good.

Behavioural economists have made many contributions to understanding human decision-making, most notably the inclusion of attitudes and beliefs into rational choice theory. Behavioural economists modify the standard view of homo-economicus assumptions of rationality by considering human physiology and acculturation. Polanyi's notion of the disembedded rational actor, cut loose from relational ties and traditional roles becomes progressively more reality congruent. The field emerged around the same time as Freud was discovering the field of unconscious motivations and economists applied this to counter rational choice theory. In a paper exploring motivations behind willingness to pay, Spash et al. 2009 argue that attitude-behaviour models and the theory of planned behaviour from social psychology could improve how economists understand human behaviour. These theories put forward three initial determinants of human intention:

1. Behaviour is moderated in relation to favourable or unfavourable self-evaluations or appraisals of said behaviour;
2. Social pressure to perform specific behaviour and;
3. The ease or difficulty of performing the behaviour.

These three determinants of behaviour explain why people want to be 'environmentally friendly' (it's a good thing to do and there is social pressure to do so – numbers 1 and 2) but don't behave accordingly (their actions are too inconsequential, so it is too difficult to make any

impact – number 3). This makes it difficult to assume how anyone might behave because everyone evaluates these differently.

In a traditional economist's ideal economic world, decisions would be based on rational consideration of costs and benefits resulting in optimal and predictable purchasing decisions. In 1976, Gary S. Becker outlined this as 'rational choice theory' which assumes human actors maintain stable preferences and will make logical and maximizing choices (1978). While economists still use rational choice theory, it is fiercely opposed by many (Green and Shapiro 1996; Hollis and Nell 1975; Foley 2014; Kahneman and Tversky 1979), most eloquently by Pierre Bourdieu who argued that social agents do not behave rationally, but according to their "feel for the game"² (2005, p. 3). Behavioural economists point to a set of ideas that interfere with a person's supposed rational choice, such as mental accounting, the psychology of price, salience, status quo, time discounting, trust, and reciprocity (relational goods) (G. S. Becker 1976).

The popular economic historian, Sowell, said that a society's opportunities are not what determines an individual's options for behaviour (1999). Rather, the culture in that place is the determining factor. Of this, Williams says:

"...this is because individuals begin to experiment with new ways of doing things when they perceive the existing set of cultural norms as inadequate to guide decision making. So for some individuals behavior has changed. The discrete acts of individuals are insufficient to alter generally held beliefs. However, a group level crisis of shared beliefs does emerge when a critical mass of individuals begin experimenting with new strategies. A new equilibrium system of shared beliefs is achieved when beliefs about the consequences of pursuing new strategies becomes widely disseminated"

(Williams 2007, p. 250).

² By 'feel for the game' Bourdieu is referring to the habitus of individuals or groups within the 'field'. A field is the setting in which agents are located. The use of the term 'field' is meant to widen his analysis from class to any historical social-spatial area in which individuals compete for resources.

Berger and Luckmann expand on this saying that activities then get institutionalized as a result of repeated patterns of behavior that evoke shared meanings among the group (1967). Despite these nuances of culture, meaning, and social change modeling remains a typical practice in behavioural economics as some try to predict these behaviours. Given that individuals make one decision in a certain context and an entirely different decision in another suggests that the use of predictive models is only useful in specific contexts for learning about the general behaviour of a system. Despite their drawbacks, models can still be useful for developing an overall sense of the world and how variables may impact known system dynamics. One useful model, built from previous models in behavioural economics over time, comes from Williams (2007) (Figure 6).

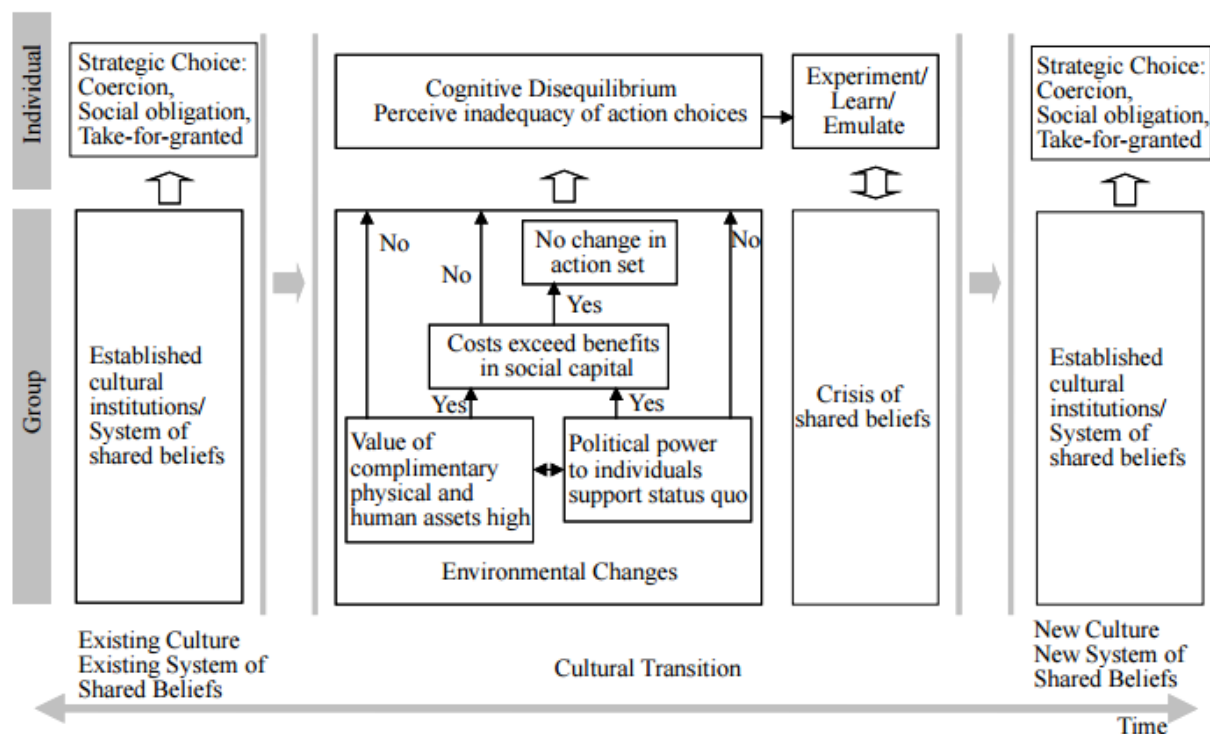


Figure 6: William's model for individual and group behaviour from Williams 2007

William's model is useful for thinking about social change because he has built the model from an interdisciplinary perspective using methodological pluralism in consideration of culture. Williams model pairs easily with my framework for ecological economics, given that he has clearly assigned importance to culture. It is important to me to pair the outcomes of my research and implications for the social sphere with an accepted behavioural economist's model for behaviour change as the intention of my research is to suggest pathways for change based on research outcomes. These outcomes should relate and translate across academic disciplines as much as possible, without losing their initial purpose.

In William's model, he suggests that an important part of understanding how individuals consume is to look at the structure of cultural institutions and systems of shared beliefs. When the costs of the larger system begin to exceed the benefits of social capital, there is a cognitive disequilibrium in the group and a 'perceived inadequacy of action choices'. Arguably, this is where Western society is now – many are aware of growing issues but there is little anyone is willing to do about it. Some are beginning to experiment with new ideas, the next stage of William's model, which eventually shows an alternative which can contribute to a crisis of shared beliefs outside of the mainstream system. Once sufficient numbers transition to this experimental and crisis stage, then there can be a shift to a new culture or new system of shared beliefs. This process is similar to two of the theories of social change I am going to explore later in this chapter: prefigurative politics and resilience theory. Prefigurative politics are those who establish alternative political or cultural systems that become opportunities for system transition. Resilience theory is the study of how social systems go through these transitions.

Williams model is interesting in relation to the case studies I present because it indicates that if there is a sufficient number of individuals who can come together and contribute to a crisis

of shared beliefs in response to the cognitive disequilibrium spawned by the excessive pressure being put onto social and environmental capital, then there could be a transition to a new widely shared system of beliefs that can push the overall system towards transition. Williams model hits at the tensions and challenges of this, mainly that the strategic choice, social obligation, and taken for granted norms of the existing culture will change when the system shifts to a new culture. He doesn't go into the implications of this, or even acknowledge that this is a problem. I explore the implications of this shift in Chapter 4.

3.2. Sociology of radical change

Some sociologists use two dimensions to demarcate four paradigms of thought, two of which are part of the sociology of radical change (Figure 7). The two dimensions are the nature of science (subjective or objective), and the nature of society (regulation or radical change) (Ardalan 2009).

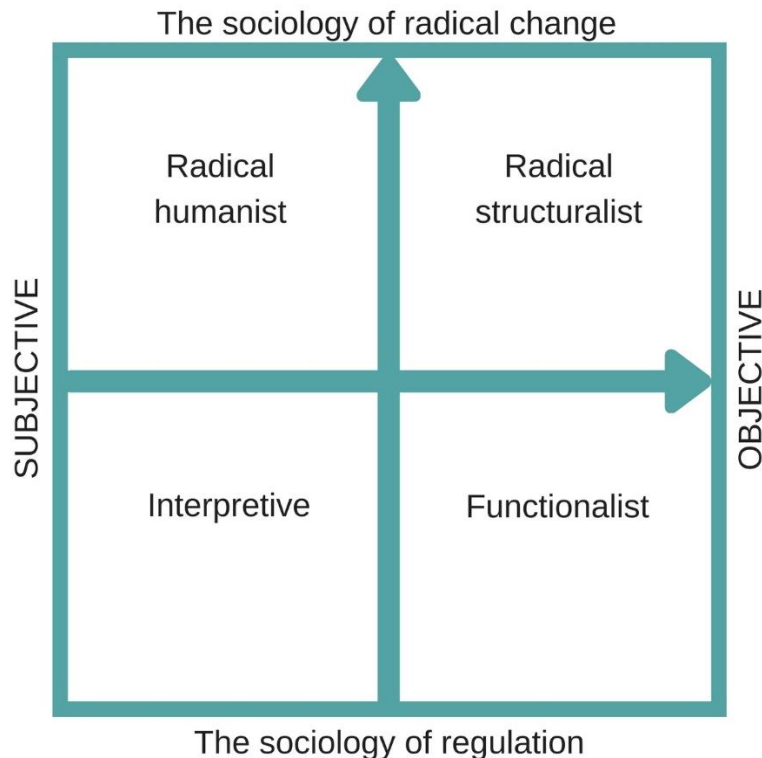


Figure 7: Four paradigms of sociological thought

Ardalan goes on to summarize the four paradigms using globalization and culture:

“The functionalist paradigm views globalization and culture as universal, the interpretive paradigm views ideology as particular, the radical humanist paradigm views globalization and culture as a domination ideology, and the radical structuralist paradigm views globalization and culture as causing conflict between classes. ... While each paradigm advocates a research strategy that is logically coherent, in terms of underlying assumptions, these vary from paradigm to paradigm.”

This four-way split relates to the problem of structure/agency and philosophical materialism/idealism, which is a debate on the extent to which human ideas and consciousness are structured/determined or conditioned by social conditions (structuralist) or are free-floating and autonomous. I will focus on the two paradigms within the sociology of radical change.

The radical structuralist paradigm focuses on structural relationships and emphasises that radical change comes from the very nature and structure of society. Radical structuralists argue that society is characterised by conflicts which generate radical change through crises, a concept I apply as one of my theories of social change – specifically in the discussion of the base/superstructure metaphor explored in section 4.1. This materialist account suggests there are limits to the kind of change that can take place in society because the society itself is the incubator for said change.

The radical humanist paradigm emphasises the importance and dangers of overthrowing limitations of existing social arrangements. An underlying notion of this paradigm is that the consciousness of human beings is structured and dominated by ideological superstructures, an idea central to this dissertation. Radical humanists seek to change the social world by altering modes of cognition which is very difficult, or maybe impossible. If, for instance, we're looking to change the ideological superstructure such as consumerism and individualism, there may be little flexibility in doing so. There are limits to how much cognitive change can take place because a person's cognitive function is a product of their environment. The unity of the human

species and our common plight is made available through reflection, psychoanalysis and education, which applies to later discussions on terror management in section 3.3.

This dissertation falls close to the line between these two paradigms. However: more importantly, most environmental approaches, even those within ecological economics, are much more interpretive and functionalist, such as those measuring one's willingness to pay for nature or trying to measure our success of a species in numerical terms. Most of the critiques on challenges for implementing degrowth economics focus on institutional and technical difficulties (Joutsenvirta 2016; Cattaneo et al. 2012; Kallis, Kerschner, and Martinez-Alier 2012) rather than on social preconditions that make change difficult. Hobbs and Allison specifically place themselves in the functionalist box (Allison and Hobbs 2006, 61). This is unfortunate because ecological economics started as a radical change theory but has since been watered down by economists to become more palatable within mainstream institutions (Spash 1999; 2017). There is now greater research and development in the functionalist paradigm within ecological economics rather than within a paradigm more centered on theories of social change, as discussed in the previous chapter.

Joutsenvirta states that this “is unfortunate because we cannot escape the fact that non-growing economies have to be built from existing institutions” (2016, 24) and therefore requires a deep understanding of how those existing institutions can be influenced and how they may respond to change. Daly made a similar point in his popular book *Steady State Economics*: “a realistic discussion of a transition cannot assume a blank slate, but must start with the historically given initial conditions currently prevailing” (1991, 190). Therefore, ecological economists need a better understanding of a) historical sociology and b) the limitations presented by looking at

society as messy and complex slates rather than a blank one. This is exemplified in a quote from Marx in 1852, while reflecting on the possibilities of the future of the Communist League:

“Men make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past. The tradition of all dead generations weighs like a nightmare on the brains of the living. And just as they seem to be occupied with revolutionizing themselves and things, creating something that did not exist before, precisely in such epochs of revolutionary crisis they anxiously conjure up the spirits of the past to their service, borrowing from them names, battle slogans, and costumes in order to present this new scene in world history in time-honored disguise and borrowed language.”

3.3. Terror Management Theory

Ernest Becker published *The Denial of Death* (1973) which offered a “broad and powerful conceptual analysis of human motivation based on the notion that the awareness of death, and the consequent denial thereof, is a dynamic force that instigates and directs a substantial portion of human activity” (Solomon, Greenberg, and Pyszczynski 1998, p. 10). Becker identified important similarities between humans and animals to understand human behaviour. He attributed a human’s recognition of mortality as a primary motivator for human behaviour. While the advancement of this cognitive awareness of mortality was evolutionarily advantageous (Solomon 2003, p. 21) it allowed humans to reflect on their mortal condition. Becker remarks:

“Man emerged from the instinctive thoughtless action of the lower animals and came to reflect on his condition. He was given a consciousness of his individuality and his part divinity in creation, the beauty and uniqueness of his face and his name. At the same time he was given the consciousness of the terror of the world and of his own death and decay. This paradox is the really constant thing about man in all periods of history and society; it is thus the true “essence” of man”

(Becker 1973, p. 69).

In response to this recognition of finitude, humans have developed mechanisms to cope with death anxiety. A primary method of this is via cultural worldviews, which provide a sense of meaning. Cultural worldviews are “shared meaning systems that provide a theory of existence, which gives meaning to life, and standards of value, which are guides for appropriate behaviour and yardsticks against which people’s value can be

assessed” (Pyszczynski and Kesebir 2012, p. 76). Humans develop mechanisms for “civilizing, spiritualizing, and ultimately denying their fleshy mortality” (Rowe 2014, p. 2) so as to see ourselves as “enduringly significant contributors to a meaningful reality rather than as mere transient animals groping for survival” (Greenberg, Solomon, and Arndt 2008, 116).

While cultures vary greatly, Becker argues they all provide the same psychological function: insulating us from the fear of death. However, these cultural worldviews are insufficient. Becker went on to propose that humans take on prescribed social roles to acquire a unique sense of significance and see themselves as an individual of value to the world and to prove that they “count more than anything or anyone else” (Becker 1973, p. 4) and to bolster their self-esteem (Greenberg, Pyszczynski, and Solomon 1986) (which is significant for discussions on narcissism in Chapter 7).

Becker’s work was largely dismissed by academics but reinvigorated in the 1980s by Solomon, Greenberg and Pyszczynski in the form of Terror Management Theory (TMT): “The idea that much of our basic identity and motivation function to assuage deeply rooted anxieties emanating from the awareness that, ultimately, no matter how you slice it, we are doomed to the grave” (Arndt and Vess 2008, p. 910). Arndt and Vess went on to argue that TMT would be “of no use to any psychologist, alive or dead”. Since then, TMT has led to over 500 studies in more than 20 different countries offering a “distinctively integrated account of social psychological phenomena that includes prejudice, altruism, conformity, terrorism, aesthetic and political preference, and interpersonal relations” (Sanitti, 2017, p. 5).

One of the most researched themes in TMT is mortality salience (MS) which states that “if a psychological structure functions to buffer awareness of death, inducing people to think of

their death should increase their need for this psychological structure” (Hayes, Schimel, Arndt, and Faucher 2010, p. 701). Janis Dickinson argued that because of this, when environmentalists remind the public that climate change is imminent, they resort to the lowest-common-denominator of self-esteem: consumerism to form identity and status (2009). Relatedly, researchers have demonstrated that death primes impact social allegiances and can create intergroup conflicts based on cultural differences such as race, ethnicity, gender, and nationality (Sanniti, 2007, p. 9) leading to in-group (those who validate one’s cultural worldview) and out-group (those who challenge it) evaluations (Greenberg, Koole, and Pyszczynski 2004).

One consequence of modernity is that individualism, cultural relativism, and secularisation (Beck 1992; Giddens 1973; Grosby 2013) have undermined cohesive, culturally-sanctioned and shared “hero projects” (Giddens 1990; Kish, Hawreliak, and Quilley 2016). Identities and methods for developing self-esteem that were once clear have been made murky through the process of modernity, especially as consumption developed into the most common route for the development of self-esteem. For example, being a good mother is no longer simply about ensuring your child is loved and fed. Instead, mothers are bombarded with a host of expert information to help make the ‘best’ decisions regarding every decision they make and are constantly questioning their abilities. This has led to higher instances of mothers feeling depressed, uncertain, and confused (Bailey 1999; E. J. Lee 2008).

Consumerism helps to navigate this confusion and uncertainty. Consumption, personal style, and making the right consumer choice are markers of prestige and self-worth (Kasser and Sheldon 2000). Mothers feel better when they choose the highest safety rated product and will share this decision with others. Consumerism serves a double function, first to distract people

from their doubts and mortality while secondly, providing a visible façade to the rest of society to proclaim success and prestige.

This partially accounts for why people continue to passively consume even when they are aware of associated negative impacts: the self-esteem gained through consumption may overwhelm any moral quandaries (Dickinson 2009). Therefore, if those interested in advancing the green political action hope to counter everyday consumption – one of the main drivers of environmental deterioration – they need to provide alternative sources of meaning and self-esteem (such possibilities include family, community, or using their hands to make). This means taking on a clear agenda on a vision of morality, virtue, and ‘how best to live’ through more ecological and community-oriented hero/immortality projects. However, such an agenda may contradict the ‘equity’ pillar of ecological economics or may challenge the liberal definition of ‘equity’ to focus on smaller, and more insular, community contexts (I extend this argument in chapter 7). The ecological economic agenda continues to focus on things such as valuation of ecosystem services, environmental policy, cost-benefit analysis, and other functionalist approaches to change rather than taking a clear stance on how to navigate the challenges of environmental psychology.

3.4. Resilience and Transition

Discourses on resilience and transition are rooted in systems theory. My approach to understanding systems change is premised on the adaptive cycle. The adaptive cycle is an element of ‘panarchy’, Figure 8, which refers “to the framework for conceptualizing coupled human-environment systems” (Gotts 2007, p. 1).

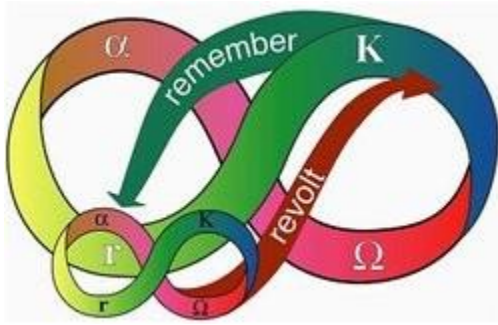


Figure 8: The Adaptive Cycle

Panarchy has two integral pieces to it: 1) the resilience framework and 2) the adaptive cycle metaphor. Characteristics of the resilience framework include: a) multiple possible regimes rather than a single equilibrium; b) an emphasis on episodic change given that systems may switch rapidly when thresholds are passed; c) resilience, which Holling and Gunderson define as “...the magnitude of disturbance that can be absorbed before the system changes its structure by changing the variables and processes that control behaviour” (2002 p. 28); and d) multiple scales with cross-scale interaction that make a multiscale hierarchy. The adaptive cycle metaphor is characterised by a) a four-phase cycle, b) panarchy, and c) three distinct kinds of change. Holling and Gunderson argue that most socio-ecological systems follow a four-phase cycle:

1) exploitation (r); 2) conservation (K); 3) release (Ω); and 4) reorganization (α).

The first and second phases come from ecological theory in which “an ecosystem’s r phase is dominated by colonizing species tolerant of environmental variation and the K phase, by species adapted to modulate such variation” (Gotts 2007 p. 2). The third phase, a rapid phase such as a forest fire or insect outbreak that frees nutrients from biomass, is sometimes referred to as ‘creative destruction’ because as the adaptive cycle moves into the release phase, power and resources that were once tightly consolidated within the dominant basin of attraction are freed up and made available for use by other actors, including pre-existing alternatives (Holling & Gunderson 2002 p 45). It is within this space of creative destruction that prefigured political

ideologies can coalesce around an emerging attractor, deepening the alternative basin (Marx 1844; Schumpeter 1942, 1947). In the fourth phase, “resilience and potential grow, connectedness falls, unpredictability peaks, and new systems entrants can establish themselves” (Gotts 2007 p. 2).

The adaptive cycle is a metaphor to be used when generating hypothesis but the exact interpretations of resilience, potential, connectedness and how the system will react are system dependent (Holling and Gunderson 2002). Panarchy refers to the idea that socio-ecological systems form nested sets of adaptive cycles. Larger cycles that move slower often contain smaller and faster moving cycles. There are three distinct ways that change happens within panarchies: a) relatively predictable and incremental change in the r and K phases; abrupt change from K through α ; c) transformational learning with change happening among several levels. While the adaptive cycle has received criticism in its application to ecosystems (Janssen et al. 2006), it is a useful way to conceptualize how change can happen in complex systems over time, particularly in it’s contribution to the metaphor of the gravitational landscapes (Figure 9), which helps to conceptualize the process of transition. This metaphor has been applied over the past two decades to ecological systems in the sub-discipline of resilience studies (Walker and Salt 2006).

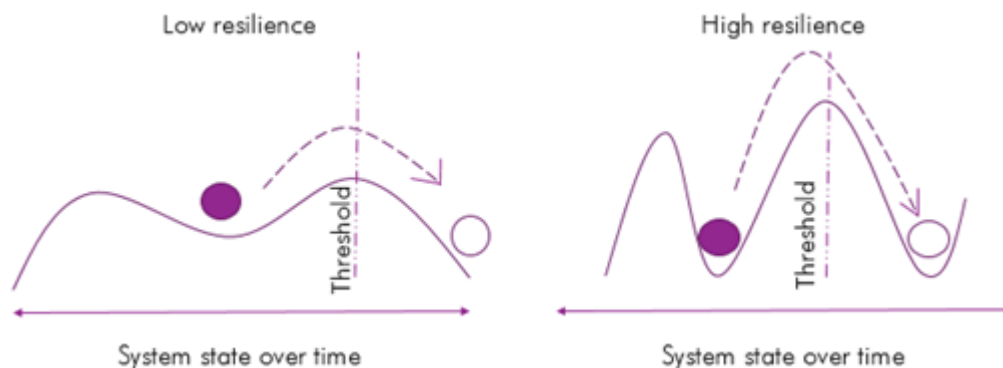


Figure 9: Basins of attraction over time with two different levels of resilience between system states

The gravitational landscapes metaphor focuses on three key concepts of a system: a) a system's resilience, b) a system's thresholds, and c) the 'basin of attraction' in which the system lies. Within this field of study, resilience refers to a system's ability to adjust, rebound, or avoid crossing a threshold. If a system passes a critical threshold, it falls into a new "basin of attraction," with its own distinct structure and patterns of feedback. The more difficult it is to pass the critical threshold, the more resilient the system. From Walker and Salt:

"The threshold is the lip of the basin leading into an alternate basin where the rules change...the system in the new basin has a different structure and function. The system is said to have crossed a threshold into a new basin of attraction – a new regime. These differences can have important consequences for society and so some basins of attraction are deemed desirable and others not" (2006, p. 55)

Once the system reaches, and passes, the critical threshold, there is a gradual or sudden breakdown of order (Ehrlich and Ehrlich 2010 argue that modern capitalist society is already in the process of a gradual breakdown) moving the system toward collapse and reorganization. This is the peak moment for opportunity to implement change strategies for transformation. When I refer to 'collapse' I am pointing toward the decline or reorganization of the current variety of capitalism and globalization toward a new political economy. However, given the interconnectedness of systems, this implies significant restructuring of society and serious trade-offs.

Using very simple cup and ball diagrams (Figure 9), such a transformation, represented by a ball, tends to 'fall' towards a stable equilibrium or 'attractor.' The resilience and stability of an attractor is represented by the shape of the cup or "basin of attraction," with deeper cups representing more resilient systems (and stronger attractors).

This metaphor is especially utilized in resilience thinking. Resilience thinking is “an approach, part philosophy, part pragmatism” that seeks to answer questions such as “what are the important qualities of a system that need to be maintained or enhanced for a system to be sustainable?” (Walker and Salt 2006, p. 8). While resilience is a term often used in socio-ecological studies, the larger implications of the landscape metaphor are rarely explicitly explored as a way to draw attention to the challenges of environmental change. Once established, an attractor may be highly resilient and stable – with a deep basin of attraction, such as the basin of consumer capitalism in which we are currently trapped. The gravitational landscape metaphor also implies that across a landscape of possibilities there are multiple possible basins of attraction into which the dominant system could fall – with some being more accessible than others.

The basins of attraction occupied by contemporary society is reinforced on two fronts: 1. The possibility of transitioning into a new basin of attraction is highly associated with collapse and discomfort. Undermining the current basin means potentially undermining the welfare state, social services, and all of the socially beneficial institutions that have emerged alongside environmental degradation. 2. The enormous variety of existing ideologies, political movements, or social movements makes it difficult for any single new movement to gain traction. As the ecological crisis worsens, and death anxieties are increasingly primed through climate-related events and news, this is likely to become even more of a problem. It may be that any change needs to be authoritarian and quiet, waiting for the right moment to emerge.

The cultural and psychological dimensions of this study may act to reveal some elements of a new environmentally friendly basin of attraction that would strengthen it as an opportunity for the future. This study is meant to explore an existing social movement that may offer possibilities that, taken together with other social movements, could tip us toward a new basin or

an alternative green modernity emerging from existing green radical agendas. This is the basis for ‘prefigurative politics’, which is the development of “shadow networks” (Westley et al. 2011) of alternatives that could rapidly expand their reach in the wake of nonlinear systems change.

Prefigurative politics consist of social movements which create or embody the ontologies and structures they envision for a transformed society “by structuring their own practice according to the principles they want to see govern the whole society” (Leach 2013, p. 182). For social movements working toward radical change, prefigurative politics is a way to enact new patterns of social relations that can be imagined from within the current system, but that diverge too much from the mainstream to gain widespread traction under existing conditions (Breines 1980; 1982). Most social movements in the 20th and 21st centuries such as those for women’s rights, the environment, peace, anti-globalization, anti-capitalism, economic equity, and Indigenous rights have included prefigurative elements (Day 2005; della Porta et al. 2006; Graeber 2009 as cited in Leach, 2013; Cornish et al., 2016).

Breines argues that the crux of prefigurative politics lies in the substantial task for individuals to live the practice of their movement so that relationships and political forms of the desired society are already in action (1980). John Holloway argued that for those seeking to fundamentally transformation society the solution is simple: “Refuse-and-create” (Holloway 2010, p. 50)! The route to overthrowing capitalism, Holloway argues, “lies in the proliferation of small-scale rebellions against capitalist logic” (Young and Schwartz 2012, p. 221) envisioned by “a multiplicity of interstitial movements” (Holloway 2010, p. 11) all with the same unifying thread: to overcome the alienation characteristics of capitalist labour and replace it with work and activities that are fulfilling, voluntary and socially useful (p. 198).

While a lot of current literature on prefigurative politics focuses on how activists should build social movements (Chen 2016; Epstein 1991; Polletta 1999, 2002), the “original concept of prefigurative politics involves a politicization of everyday life” (Williams 2017), so to capture the full spectrum of prefigurative politics we need to see changes in everyday life as radical acts of resistance – such as making, parenting, and being with family.

3.5. Concluding remarks on theories of social change

A strong theory of change emerges when these pieces are woven together. Behavioural economics tells us that people are driven by non-rational drivers and that cognitive, evolutionary, and cultural influences are very important for influencing individual decision making. Applying a radical humanist paradigm, we know that culture is not the only key, but that the base-superstructure (production-culture) relationship (covered in Chapter 4) is paramount in discussions of how change happens over time and in discussions of nonlinear implications of change. Radical structuralists also approach change with the assumption that culture is vital but add that crisis events are vital areas of opportunity to cultural shifts. This is supported by resilience theory, given that the collapse phase of a system is usually followed by a process of reorganization, characterized by widening and greater availability of opportunities. This also harkens back to William’s model of social and cultural change as he indicates that a crisis of shared belief is required for a system transition – a social threshold needs to be passed while simultaneously building cohesive social practices to inform reorganization. TMT suggests that in capitalizing on this opportunity for reorganization, cultural change must be done in such a way as to bolster self-esteem. TMT predicts that people will always engage in hero/immortality projects. Given the characteristics of the current basin, the current lowest common denominator project is a diverse consumer society. Thus, the goal is to engender shared alternative and

compelling ontologies and hero/immortality projects to counter the ease and pervasiveness of consumer culture. This means that the response to collapse cannot be a wide call to the world from environmentalists that we are in danger and must act quickly; instead, people need to be offered something new that helps to deliver hope through a crisis. This highlights the strategic importance of identifying prefigurative political options that already exist so as to gently nudge individuals and groups forward as crises unfold.

For example, if ‘Maker Culture’ does bolster self-esteem and aligns with an environmental lifestyle, then an ecological economic approach to change would be to suggest that a municipal government open and fund a Makerspace that holds strategically timed workshops – such as a “DIY candle making and personal space warmer” workshop after a large power outage in the winter. Or to recommend that a municipal government promote a local currency workshop after a large recession. These solutions a) focus on a wider cultural approach of empowering individuals, b) include both realms of culture and production (base and the superstructure), c) take advantage of a crisis, and d) can be quietly cultivated as prefigurative politics within a municipality until the right time emerges.

These theories of social change embody the core of my research question and approach. If we are indeed at a time for reorganization, what kinds of prefigurative politics should ecological economists look for to promote cultural reorientation? Can Maker Culture function as a method with mass appeal for changing people’s consumptive behaviour, while bolstering self-esteem? What lessons can we learn from Makers that might inform an approach within ecological economic problem solving to help us with ‘the nudge’?

4. The Problem with Change

In this section, I present a challenge to the premise of my own research question and to the work of nearly all environmentalists: the likelihood that change in our economic system will have unintended and unforeseeable consequences for our social system. Nonlinear and unintended consequences are a basic characteristic of transition in complex systems. Unintended consequences could undermine the whole process of capital accumulation and technical innovation by leading to a catastrophic collapse of demand. This was the central problem of the inter-war period, solved first by rearmament and war, and then by Keynesian economics and the establishment of the welfare state. The real challenge of unintended consequences is that they could undermine the social-economic basis for cherished values and institutions as well as taken for granted aspects of social personality and psychology (Pinker 2012; Quilley 2013; Rifkin 2009). I explore the problem with change through three avenues: a) the base-superstructure relationship, b) historical sociology, and c) complex systems.

4.1. The Base-Superstructure

In the social production of their life, men enter into definite relations that are independent of their will, relations of production which correspond to a definite stage of development of their material productive forces.

The sum total of these relations of production constitutes the economic structure of society, the real basis on which rises a legal and political superstructure and to which correspond definite form of social consciousness.

Marx 1867

Our ideas and the way we speak are not random (Marx 1876). They are intimately connected with one another and with social structures and institutions. How we create things, consume, and relate to one another (the social base) is intimately tied to media, culture, and politics (the

superstructure). The base shapes and maintains the superstructure and the superstructure shapes and maintains the base (Figure 10).

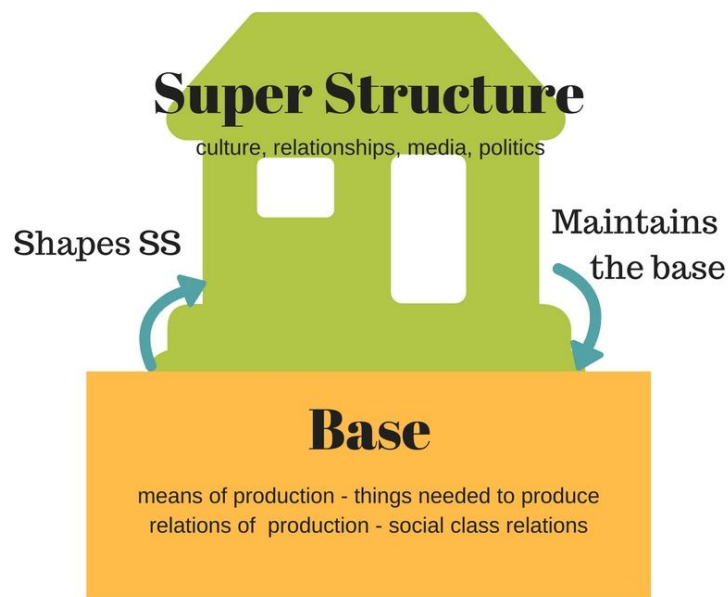


Figure 10: The base/superstructure model

This is a metaphor associated with a brutal form of Marxism but begins to frame the problem of change quite well. While this metaphor suggests a determinism in society, I would like to frame it for this discussion as the base representing ‘conditions’ or ‘limits’ to the superstructure. Different people have interpreted this metaphor with varying degrees of literalness. Marxists on extreme view the base as a strong and deterministic force of production which “inevitably advance, and that this in turn leads to changes in society” (Harman 1986). In this way, political and ideological struggles are seen as playing little to no role in social change because individuals are products of their circumstance; revolutions, wars, and arguments are already determined. The other side argued that Marx’s writing is devoid of fatalistic approaches to history; laying great emphasis on remarks from Engels:

“Political, juridical, philosophical, religious, literary, artistic, etc. development is based on economic development. But these all react on one another and also upon the economic basis.

It is not that the economic situation is cause, solely active, while everything else is only passive effect. There is rather interaction on the basis of economic necessity which ultimately always asserts itself.”

(Engels, 1894)

Post-1956 new leftists argued that “the terms ‘base and superstructure’ were simply a metaphor, not to be taken too seriously. The reciprocal influence of the superstructure on the base meant that “determination was not to be seen as a strict causal relationship” (Harman 1986). After this, society was seen as having a number of different interacting structures, each developing at their own speed i.e. politics, economics, ideologies, linguistics. All these structures are influenced by the base, and influence the base in a reciprocal formation.

For my dissertation, and for environmentalists, I draw on this less deterministic metaphor of the base/superstructure. Despite the lack of strict determinism, this still means that as we change the material base of society (or shift to a new basin of attraction), our superstructure will also change, likely in unpredictable and nonlinear ways. Environmental advocates of simplicity and low/no/de-growth may underestimate the wider implications of their visions for Western liberal society. An example would be that any large-scale increase in people working in agriculture might engender the kinds of feelings, priorities, and temporal orientations that peasant agriculturalists once had (Quilley 2013).

Progressive forms of social emancipation relating to class, gender, race and ethnicity, disability, and sexuality have been made possible by the base consisting of growth economics and by the expansion of social complexity, which is in turn dependent on harnessing cheap energy. For example, the rights of individuals, characteristic of the enlightenment, mean that someone with a disability has the right to independent living – this requires complex structures

of care, emergency communication methods, and complex technological production to provide necessary goods for individuals to be on their own.

All public goods and infrastructure depend upon tax transfers generated, at least partially, by consumption. At the same time, the trajectory of technological innovation that has delivered everything from the Internet to antibiotics, is also inextricably bound up with the expansive consumer capitalism. The patterns of social life, socialization and identification that reproduce the individuals' characteristic of liberal societies – voters, citizens, rights-holders, consumers – are themselves engendered by and dependent upon high and expanding flows of energy and materials. Successful environmental activism and/or exogenous shocks sufficient to undermine growth, would reduce the availability of cheap energy (although we would need less energy in general) and potentially force societies to shed layers of complexity (Kish and Quilley 2017; Quilley 2013; Zywert and Quilley 2017). This would be devastating for taken-for-granted and cherished forms of social emancipation.

In other words: ecological economists and degrowth advocates seek to alter the base, while enjoying a great deal of the progressive superstructure, but they may coexist in a mutually defining feedback cycle. Asking participants about the kinds of trade-offs they have made or are willing to make is one way that I engage with this assertion in my case studies.

4.2. Social and Economic Entanglement

Since the Industrial Revolution, growth has dominated world history and human behaviour (Jackson 2009; Victor 2008). Growth emerged alongside of, and relied upon, the process of individualisation and movement toward individual rights (Beck 1992; Giddens 1987). This section is an overview of historical sociology. This history demonstrates that undercutting

complex societal systems (i.e. actions by environmentalists to avoid limits) may undermine the social progress that has come to define a great deal of Western ideals. This history and resulting collection of concepts provide a widely accepted framework, in sociology, for understanding the role of social dynamics within discourse and politics. Specific definitions of precise words (italicized) can be found in the glossary.

Karl Polanyi argued that the central dynamic, during the early shift into modern society, was the *disembedding* of economic activities as a distinct domain, separate from cultural ties (1944). Livelihood came to be structured around individual incentives for economic gain, rather than community and kin oriented. In pre-modern societies the economy was not a separate domain – individual livelihood was motivated by ongoing patterns of social life. Drawing on Tönnies’s characterisation of *Gemeinschaft* to *Gesellschaft* (movement from strong socially integrated ties of kin and place-bound community to contextually circumscribed and narrowly defined instrumental affiliations (Tönnies 1887). Polanyi argued that the disembedding of economic activity, ‘freed’ the individual from Gemeinschaftlich relationships.

The combination of the enclosure movement³ and freedom to pursue new activities (such as moving to the city to participate in the industrial revolution) removed any functional attachment to group/kin membership. Peasants were turned into individualised, free-agent, wage labourers (Polanyi 1944). *Modernisation* is characterised by this emergence of new markets:

“not blood tie, legal compulsion, religious obligation, fealty or magic compel participation in economic life, but specifically economic institutions such as private enterprise and the wage system”

(Polanyi 1971, p. 81).

³ The Enclosure Movement is characterized by smaller farms being bought and amalgamated into fewer numbers of larger farms and by common land coming under private ownership. The farmers of the smaller farms left the countryside and moved to the city to become urban workers.

Separation from land and kin ties allowed for individual mobility, to become part of the emerging industrial complex. As industrialism and the industrial workforce grew, groups of workers began living in conveniently located clusters to access work. This was the early beginnings of industrial cities. Cities were filled with “frantic bustle, rife with egoism and alienation from neighbours” (Kumar 1991, p. 67). Cities created the conditions for multicultural exchanges and tolerance of ideas, faiths and cultures. The growing number of distinct social roles and a shift in the I/We balance, toward the ‘I’, encouraged a more closed personality structure (Elias 1991).

Sociology emerged as an effort to understand these new forms of society and to develop concepts to explain the social outcomes of the changes of *modernity*. Typical contrasts between pre-modern and modern societies include understanding time as progressive and linear, a shifting orientation toward the future, prioritisation of progress (direction), increasing rates of change, technological innovation and shifting modes of experience “of space and time, of the self and others, of life’s possibilities and perils” (Berman 1988, p. 15; Giddens 1987; Giddens 1990; Toulmin 1992).

Beginning in the industrial revolution, rapid progress and discontinuity became prominent themes among social commentators (Giddens 1990; Toulmin 1992). For instance, de Tocqueville described Manchester in this way:

“It is the Styx of this new Hades...From this foul drain the greatest stream of human industry flows out to fertilize the whole world. From this filthy sewer pure gold flows. Here humanity attains its most complete development and its most brutish; here civilisation works its miracles, and civilised man is turned back almost into a savage”.

(de Tocqueville 1835, p. 107)

Similarly, modern outcomes of industrial society were described by Berman as a “terrible beauty” (Watson 2013), fraught with both great hope and despair. Berman expands on this nature of modernity:

“Modern environments and experiences cut across all boundaries of geography and ethnicity, of class and nationality, of religion and ideology: in this sense, modernity can be said to unite all mankind. But it is a paradoxical unity, a unity of disunity: it pours us all into a maelstrom of perpetual disintegration and renewal, of struggle and contradiction, of ambiguity and anguish. To be modern is to be part of a universe in which, as Marx said, “all that is solid melts into air.”

(1988, p. 15)

During the 20th century, “the social processes that bring this maelstrom into being, and keep it in a state of perpetual becoming” defines *modernisation* (Marshall Berman 1988, 16). Berman goes on to say that these social processes nurtured a wide variety of ideas and visions aimed to make individuals both the subjects and objects of modernization; this provided individuals with a sense of power to change the world, which was, at the same time, changing them. Individuals used this “to make their way through the maelstrom and to make it their own. Over the past century, these visions and values have come to be grouped loosely together under the name of *modernism*” (1988, p. 16).

These early dynamics of capitalist modernity engendered social relations and patterns of further individualisation that began to epitomize and idealise the rational sovereign individual. Tied up in this process is a series of binaries discussed by sociologists as emergent from the discontinuity of individualised and progressive modernity (Giddens 1990), including:

1. *Gemeinschaft* and *Gesellschaft*
2. *Mechanical* versus *organic solidarity* (and *anomie*)
3. *Enchantment, disenchantment* and rationalisation (and bureaucracy)
4. *Formal* versus *substantive rationality*

5. *The division of labour*
6. *Alienation* and efficiency

This collection of concepts is important as it provides a framework that is widely accepted in sociology for understanding the influence of social dynamics within environmental politics and discourses, as people engage with changes and limits to growth over time. These frequent binaries all have in common individualisation and the process of disembedding from Polanyi. Taken as a whole, these concepts represent a theoretical lexicon through which sociologists have sought to explore the dynamics of modern societies (Giddens 1987; Elias 1978, p. 76). Alongside stages of modernity these concepts help to understand the characteristic substantive change.

Emerging out of this substantive change was also a modern set of broadly liberal commitments (i.e.: individualism, law, Enlightenment). These commitments came to underlie progress, becoming the cannon of Western society. They are tied to the process of *disembedding* and generation of the highly complex systems produced by modernisation. Thus, liberal commitments (and ideological attempts to make sense of one's self within the process of modernity – feminism, jihadism, Marxism, environmentalism) are intimately tied to capitalist modernity (Quilley 2012), and consequently the high energy throughput society associated with industrialism.

The functions of social complexity (liberalism, individualism) are intimately coupled with high energy throughput, characteristic of capital growth. There is a correlation between the hundreds of millions of commodities traded on the Internet, the hundreds of thousands of distinct social roles, the mobility of both people and capital, the enormous expansion in regulatory infrastructure of the state, and the social-psychological process of individualization. These

systems arose together, intimately entangling social progress with environmental degradation. Ecological economists seek to undermine capital growth, which has developed into a highly resilient basin of attraction and it seems the more resilient and pervasive the basin of attraction, the more entangled and dependent the system processes become.

4.3. A Complex Systems View

In the field of complex systems, nonlinearity is a characteristic of a system (Berkes, Bolding, and Folke 2008). From this standpoint alone, we can assume there will be unintended consequences of change in any system. Beyond that, complex systems studies also tell us that scale and nested complexity is important when considering the reaction of a system. If one subsystem is reliant on another, and that higher ordered system is disturbed, then the lower ordered system will also be disturbed. I draw this argument out in this section.

While the universe has an overall tendency toward unorganized chaos (entropy), pockets of order appear in localized areas. These pockets may have ever increasing propensities toward organized complexity:

“certain factors – energy, matter, life, and complexity among them – appear to be self-potentiating: the more of them there is, the more powerful the impetus to the production of yet more. Left to its own devices without let or hinderance, such a tendency is liable to result in exponential growth”

(Rescher 1998, p. 3).

Applying these ideas analogously, it can be said that human culture and current modes of experiences (modernity) are one such pocket (Christian 2011) and that ecological economics needs to find a way to internalize constraint in individuals and society to go against this, which has two consequences. First, this increasingly ordered complexity requires the constant throughput of energy. For example, industrialization emerges only on the complex and technical repertoire of agrarian civilization, thereby increasing overall complexity. Second, the more

complex the pocket becomes, the more energy is required to maintain complexity, making the ordered state fragile and potentially unsustainable. Historically, greater complexity at the level of human culture is, for the most part, achieved at the expense of order elsewhere in the biosphere (Odum 2007). Complexity in any system always engenders entropic disorder out of that system; complexity/low entropy is achieved by exporting high entropy disorder (Beinhocker 2007; Daly and Cobb 1990; Georgescu-Roegen 1971). Daly applies this to the process of production:

“people can measure their throughput, or the rate at which the economy uses them, taking them from low-entropy sources in the ecosystem, transforming them into useful products, and ultimately dumping them back into the environment as high-entropy wastes”

(Daly 2005, p. 1).

Ecological economics partially hinges on the allocation of low entropy resources between the biosphere and human culture.

Because human culture is nested within the biosphere and because natural systems serve as a sink for any low entropy order that develops in the anthroposphere, any complexity in human culture (e.g. agriculture, cities, art, religion, technology, industrialization, global integration, the Internet etc.) has always been achieved at the expense of disorder in the biosphere. In the long process of social development, each advance in scale and complexity is dependent on antecedent processes and entropic order. For instance, since Thomas Paine’s original declaration of the ‘Rights of Man’, individual rights developed as a nested subsystem within increasingly extensive and complex legal and welfare systems which are nested in turn, as subsystems of the state and the market economy and so on (see Figure 11).

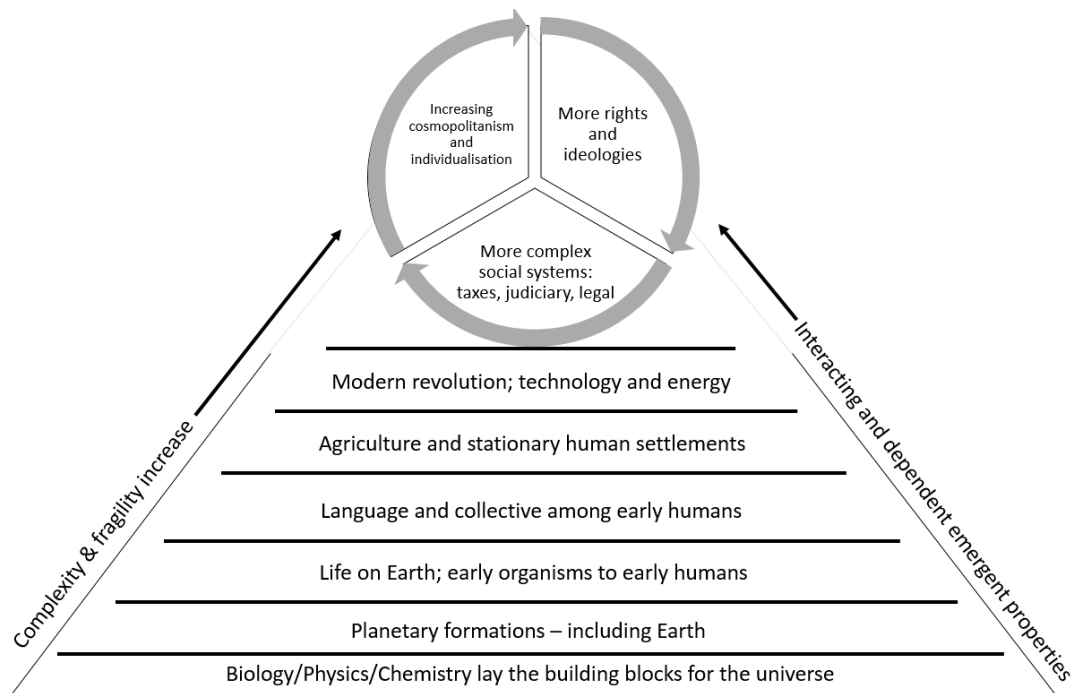


Figure 11: Entropy, complexity and levels of integration

Increasing levels of complexity are dependent upon extremely long processes of physical and social ordering of materials and people. Each level of increasing complexity is interacting and dependent upon the levels below/before it and become increasingly fragile as complexity increases – meaning it is more susceptible to system shocks and transition.

From a limits perspective, the growth in the scale and complexity of human activities is as astonishing as it is unsustainable. At the dawn of the human Odyssey, the human brain itself was possibly the most complex entity in the universe (Chaisson 2001). Using a measure of free energy rate density measured in ERGS per gramme per second, Chaisson contrasts the complexity of a galaxy (0.5), a planet (75), a typical plant (900), an animal body (20,000), a human brain (150,000) and modern society (500,000). He comments that it is “not surprising [sic] a group of brainy organisms working collectively is even more complex than the totality of its individual components” (Chaisson 2001 p. 139). With language and culture, the network of connected brains engendered a step change in complexity, in turn accelerated by writing and the integration of human societies across the planet. The connectivity of the Internet represents yet

another order of magnitude increase in complexity (Christian 2005; McNeill and McNeill 2003). However, in an era of limits, this complexification cannot continue indefinitely.

From this perspective the question for degrowth and ecological economic scholars is: are we able to transition the higher ordered systems of organization and energy transformation without losing the desirable characteristics of the subsystem? What kinds of socially progressive norms depend upon our energy usage and the way our levels of organization have emerged? This again brings us back to the question for us all: is it possible for a country to meet the UN Sustainable Development Goals while simultaneously remaining within its biocapacity?

4.4. Possible Implications

The UN SDGs new definition of Sustainable Development in the Anthropocene is:

“Development that meets the needs of the present while safeguarding Earth’s life-support system, on which the welfare of current and future generations depends” (Griggs et al. 2013).

Alongside this is a list of updated development goals, which includes ending poverty, universal education, gender equality, health, environmental sustainability, and global partnerships. This is not an exhaustive list, but each of these represents a high energy system that societies rely on to meet such a development goal. Many of the specifics on reaching these goals rely firmly on processes deeply embedded in the growth context i.e. institutional education, vaccines, making room for women in managerial positions, contraception, and ensuring people have pensions. Not to mention, one of their goals is explicitly economic growth through measurements of GDP, labour productivity, and access to financial services.

In our paper “Wicked Dilemmas of Scale and Complexity in the Politics of Degrowth”, Quilley and I introduce six dimensions of modern progressive society that would potentially be

undermined by low growth economics (Table 5). In an article published in *Alternatives Journal*, I offer two examples of social complexity and low growth economics colliding.

Table 5: Dimensions of a progressive modernity – originally published in Ecological Economics (Kish & Quilley 2017)

	Definition/features	Functional requirements/preconditions
Progressive economy	<i>Economic growth.</i> High levels of investment, with effectively regulated global and national markets, underpinning continuing technical innovation.	<ul style="list-style-type: none"> • Property rights/contracts backed by the state; • Stable patterns of trade; • Accessible flows of cheap energy
Progressive polity	<i>Low likelihood of war or conflict between states.</i> <ul style="list-style-type: none"> • High levels of interdependence • High levels of trade • Balance of power 	<ul style="list-style-type: none"> • Effective supranational governance institutions and cooperation to solve collective problems • Effective states (exercising monopolies of violence) and absence of failed states • High levels of regional and global trade, interdependency
Progressive polity	<i>A general assumption of safety and state control of violence.</i> <ul style="list-style-type: none"> • Effective external controls on behaviour • High levels of social interdependence • Internalized psychological controls 	<ul style="list-style-type: none"> • Complex legal/policing institutions; • Redistributive tax systems and safety nets; • Social cohesion and strong ‘imagined communities’; • Social integration
Progressive society	<i>Principle of inclusion and social emancipation applied to widening circle of marginalized groups.</i> <ul style="list-style-type: none"> • State child support; • progressive tax • Individual /rights-based approach to legislation/norms 	<ul style="list-style-type: none"> • Class-based social compact • Redistributive fiscal/welfare system – supported by strong ‘we identity’ and imagined community’ • High levels of social cohesion • Low levels of inequality • PROGRESSIVE POLITY (ECONOMY)
Progressive culture	<i>Positive approbation of cultural diversity</i> <ul style="list-style-type: none"> • Social equanimity about sexual/ethnic/religious diversity • Pragmatic flexible approach to ‘national culture’ 	<ul style="list-style-type: none"> • Some level of urbanism • Mass media and communications • Individualization and social mobility • Large and stable middle class • Secularization, separation of church and state
Progressive ontology	<i>Dominance of scientific worldview.</i> <ul style="list-style-type: none"> • Disenchantment (Weber; Berman) 	<ul style="list-style-type: none"> • Rationalization and secularization; • educational institutions; bureaucracy; • time/space abstraction; • disembedding; high levels of individuation

1. **Birth Control:** Katharine Zywert (2017) argues that, the modern healthcare system is highly energy intensive. A more localized economy may see the loss of sophisticated (read “high energy”) medications and health services such as birth control. Birth control has given

women enormous freedom over their bodies and lives. An IUD requires the creation of plastic and mining of copper, and pills require exact measurements of hormones in a laboratory – all of which require a lot of energy. This energy footprint is not just embodied in the particular artefact or processes of development, but that energy footprint is also distributed across the entire network of socio-economic systems that are necessary platforms for their production – for example these forms of birth control are highly associated with women’s liberation and entry into the workforce (Heer and Grossbard-Shechtman 1981; Goldin and Katz 2002). They are, in other words, associated with what Odum refers to as high ‘transformity values’ (Odum 2007): “the systems of nature and society are interconnected in webs of energy flow” (M. T. Brown and Ulgiati 2004) and the transformity is the amount of one kind of energy that is required to make another kind of energy within that web.

2. **Day Care:** In Canada, the various provinces provide varying levels of child care subsidies or monthly child benefits. Most of the budget for things like this comes from tax revenues provided by citizens and consumers. If we limit the amount of consumption and scale back the economy, we can expect to see a reduction in tax revenues, even if we increase tax rates. In this case, the government may no longer be able to provide subsidies for child care and/or child rearing. Child care has given women a great deal of freedom for returning to work and pursuing their careers. If, in a low-growth society, the government can no longer provide these subsidies, we would see fewer families with both parents working or an urgent call for the re-emergence of ‘the village’ in parenting.

The actual consequences of a low growth economy are undeterminable, but examples like the two above raise an interesting question: *What is the smallest possible ecological footprint*

necessary to support a liberal and technologically progressive society? Or, what is the highest-energy form of birth control that can remain available while maintaining ecological integrity?

This is a difficult question to answer, and we are unlikely to know before change is imperative. While these are real challenges, and low growth economics might be associated with the loss of some liberal institutions and technologies, there are possibly ways to prioritize. First, the loss of certain kinds of liberal freedoms could have both positive and negative consequences. For example, in losing the right to unfettered mobility it may limit an individual's freedom but may also increase a person's sense of place for an area, which develops ecological identity and extended empathy for that region. Ecological economics and degrowth are often associated with outcomes that make it difficult to know how these problems with change will manifest, such as decreases in issues of mental health (stress and anxiety), 'the village' re-emerging in parenting, work taking a back seat to family, and overpasses turned into gardens as we limit car use.

By facing this difficult question, and exploring what we really value about life, we can begin to consider what kinds of trade-offs we might face in exchange for living in a more sustainable future. As a way to test if this is happening, I include questions regarding these trade-offs in my interviews and case studies.

There are some other scholars who begin to touch on these dilemmas. Most recently, Dan O'Neill published a paper which quantified the resource use associated with meeting basic human needs for over 150 countries, and compared this to what is globally sustainable (2018). They found that there is currently no country that achieves a good life for its citizens at a level of resource use that could be extended to all people on the planet. Spash (2017) recognizes there is a tension between the idea that individuals have freedom to do whatever they please and the recognition that constraints on that freedom are required to achieve communal goals. Victor et al.

recognize that degrowth would mean less investment opportunities, lower government tax revenues, withdrawal of social investment, job loss, and recession and that this could be solved by investment in the ‘green economy’ (2014). Ecofeminist perspectives recognize that gender relations in a post-growth world are “murky” (Bauhardt 2014, p. 63) and that the care economy is vital, but the gendered nature of this is not explored in degrowth literatures. Likely, there would be an increase in demand for unpaid work in roles such as education, healthcare, and, consequently a deeper focus on home economics, i.e. cooking and family. The question is – who would this be assigned to? Would it fall to women or would men take on unpaid work traditionally assigned to women? Will the unpaid sector remain undervalued and misunderstood?

The most nuanced discussion comes from leaders in the degrowth literature, such as Kallis et al. (2012). They ask about the role of women’s rights, social security and free healthcare in a degrowth society, and suggest that nothing short of a revolution in all sectors would bring about sufficient change within these institutions to have a similar level of social progress. Given that these radical agendas often come about through electoral processes, they ask “...who, why and how would organise collectively to demand changes in the direction of prosperous degrowth?” There is also a question about what ‘prosperity’ looks like in this context. Because of nonlinear and unintended outcomes of change, we may need to alter what our idea of ‘prosperity’ in North America really looks like. I explore this theme with my participants by asking them how they define success and what gives them meaning in their lives.

Part 2: Logistics

5. Methodology

In my research I used a mixed methods approach, to be more comprehensive (Ritchie 2003), and elected to utilize only qualitative approaches. I did not attempt to analyze any research results with a quantitative method because the sample sizes are not big enough and the contexts of participants vary too widely for quantitative approaches to be meaningful. Also, this research seeks to explore and understand the phenomena of making within an ecological economic context, not to make any conclusive statements about the group in general. To do so I used case studies, open ended interviews, and participant observation. I used content analysis, with the program NVivo, to explore relationships between data sets and to bring together a wide-ranging set of data. NVivo is also meant to eliminate confirmation bias in analysis, which it did well in my results chapter. Given this research took place over many years, within many different contexts, including various videos, message boards, and books, and used a variety of methods and questions, NVivo offered a consolidating approach to the data. I also conducted Q-Methodology in the field, but do not include the outcomes very often in my results or discussion chapters as I had too few participants.

The purpose of this chapter is to a) introduce my case subject, b) introduce the research methods used, c) describe the data collection process, and d) introduce the approaches to analysis I use in Chapters 7 and 8 alongside the frameworks presented in Chapters 2, 3, and 4.

5.1. Study Subject: Makers

My research focused on Makers as a case study. My definition of ‘Maker’ includes anyone who takes the power of production into their own hands. This includes the traditional Maker, but also hackers (both physical and technological), farmers and homesteaders, preppers, bakers, brewers, sewers, potters, jewelers, metal workers, programmers, artists, and woodworkers. I chose Makers for three reasons: 1) prior knowledge about the relation of hand/brain connection for learning, self-esteem, and self-care, 2) initial research demonstrated a very clear community emerging in industrialized societies, comprised of those who are also participating in an alternative economy, and 3) the disruptive potential of empowering local production given the base/superstructure model.

As a collective, Makers are finding ways to bring local production together with new technology, a task that, in the past, many thought impossible – this makes them a uniquely situated community for exploring possibilities of small-scale production and localized economies. There are a variety of Makers in Canada, demonstrating possibilities for both individual and collective elements for change in a variety of contexts with wide appeal. Through local production and community support, they potentially challenge capitalist assumptions and systems, bring culture and the economy together, have an implicit environmental message/approach, and include modern technologies while attempting simplicity, though some have criticized Maker Culture as another manifestation of capitalism, particularly for the privileged class (Fox, Ulgado, and Rosner 2015; Tanenbaum et al. 2013). Makers do not necessarily upend globalization and capitalist hegemony but offer a meaningful alternative to conspicuous consumption. It is possible that links between technology, the rich history of DIY,

and collective physical ‘places’ can contribute significantly to an alternative vision of political economy.

In this section, I will explore this history of Makers, briefly discuss the psychological benefits to making, and introduce the elements of modern making that are the focus of my research.

5.1.1. History

Modern making is backed by a rich history beginning with movements against industrialisation. In the 1820s The Mechanics’ Institutes formed to provide scientific and social training to engineering and technical solutions (Inkster 1976; Sheets-Pyenson 1985) with shared libraries for working class adults. This was shortly followed by the Arts and Crafts Movement in the 1880s. The Arts and Crafts movement marks the beginning of Maker Culture philosophy and is often referenced in maker literature. John Ruskin was one of the most prominent scholars promoting the movement. He argued:

“... hand-work might always be known from machine-work ... it will be plainly seen that some places have been delighted in more than others—that there has been a pause, and a care about them; and then there will come careless bits, and fast bits; and here the chisel will have struck hard, and there lightly, and anon timidly; and if the man’s mind as well as his heart went with his work, all this will be in the right places, and each part will set off the other; and the effect of the whole, as compared with the same design cut by a machine or a lifeless hand, will be like that of poetry well read and deeply felt to that of the same verses jangled by rote.”

(Ruskin 1854).

Ruskin’s writing predicted the crisis of sustainability in relation to craft as he saw people’s minds numbed by conspicuous consumption. The products being consumed were mass produced, losing the beauty and spirit of handcrafted goods. Ruskin’s plea was for a revival of traditionally crafted goods.

William Morris brought Ruskin's philosophical and architectural ideals to a more general level. He argued for social and economic reform via labour reform and bringing art back into society. He sought to advance ideals in consumption such as simplicity, utility, honesty, and nature. He argued that we should have "nothing in [our] houses that you do not know to be useful or believe to be beautiful" (Morris 1883).

The Arts and Crafts movement was largely characterized as anti-industrial, or at least as a reaction against the rise of industrial production. Ruskin saw the new technologies of manufacturing as a radically transformative force, for the worse. Machine manufactured goods were missing the imperfection of handiwork that provides 'warmth of life'. Today, we can think of it as the difference between a table bought from Ikea and one bought from a local artisan made from a local tree which comes with a warmth and trust not provided by mass produced furniture. Its value is increased because of this, and because it is a special piece.

The Arts and Crafts movement spread to America and Scandinavia in the 1890s, particularly through Gustav Stickley who disseminated and echoed Morris' ideas in the magazine, *The Craftsman* (Freeman 1966). The magazine perpetuated the Arts and Crafts philosophy alongside simple plans for craftsman style houses and bungalows. Its remnants can be seen today in upscale neighbourhoods of Toronto in the Tudor Style homes, replicating the character of England's Arts and Crafts era cottages in the Lake District. The craftsmanship is simple and functional, executed with great care as a revolt against the poor quality often seen in mass produced homes.

In 1968, the *Whole Earth Catalogue* was published as a guide for the DIY movement. It provided information on equipment, supplies and methods of production for "everyone frustrated with industrialized mass production" (Brand 1968). In 1979, Karl Hess wrote about shared

machine shops as a sensible and practical way to re-engage with production and a base for community experimentation. This developed into Makerspaces –community operated physical places, with intergenerational knowledge capacity and space to work on projects alone or together. With over 135 million adult Makers in the US alone, 400 Maker Faires organized globally in 2015, and nearly 2000 Makerspaces worldwide (Make Magazine, 2017), maker communities potentially show a thriving new future of production (Kish and Quilley 2017).

Maker Faires are a series of venues and events for Makers to express themselves and show/sell their work (Anderson 2013). These faires have encouraged a ‘collective concept’ (Burke 2014, p. 11) among individual Makers. This community aspect distinguishes the modern movement from previous versions integrating collaboration and collective. Some in the modern maker movement also embrace technology. For example, one of the first formal Makerspaces, MIT’s Fab Labs, run by Neil Gershenfeld consists of traditional maker tools (saws, drills, etc) and digital equipment for design and production.

Pre-industrial craft ideals and Arts and Crafts philosophy are now taken up in a late-capitalist context. Craft is sometimes framed as an act of resistance as it empowers self-determination, challenges passive consumption, and undermines a highly resilient capitalist system (Bateman 2017; Corbett 2013; B. Greer 2014; Neel and Marano 2017; Tapper, Zucker, and Levine 2011). Sometimes, Makers want to identify as more than just a consumer within a capitalist state – their vision extends beyond neoliberalism with an underpinning of grassroots uprising or simply undermining the larger processes of production (Mason 2015). Making can be easily incorporated into early education to begin transforming the way young people innovate, consume, and think about raw materials. Modern technology has made it easier than ever to find plans and tutorials, disseminate and share ideas, distribute items, create trusted transactions, and

produce items in local contexts. The new movement of Makers has the potential to present a real challenge to the larger capitalist system. Coupled with growing environmental concerns and the rising cost of what were once cheap goods, Makers are filling an economic niche that also positively contributes to individual and collective psychology.

5.1.2. Psychology

Using our hands to create and manipulate feels good (Briggs 2016). When children are presented with materials to create, design, and decorate, they fall into the maker role without hesitation. Making connects the hands and brain in ways that few other things can. In a survey with over 3500 knitters, Corkhill found that crafters were ‘very happy’ after knitting. Many had started to knit to alleviate stress, and those who took to the craft more frequently indicated higher levels of mental and emotional relief (Riley, Corkhill, and Morris 2013). A smaller study looked at crafters 27-57 years old and found that crafting significantly reduced stress (Pollanen 2017).

These studies indicate that crafting contributes to well-being and quality of life. The effects of craft on the brain are like meditation or yoga, similar to Csikszentmihalyi’s concept of flow which is “a state of concentration or complete absorption with the activity at hand and the situation. It is a state in which people are so involved in an activity that nothing else seems to matter” Csikszentmihalyi, 2008). In his 2004 TED talk he said:

“When we are involved in [creativity], we feel that we are living more fully than during the rest of life, you know that what you need to do is possible to do, even though difficult, and sense of time disappears. You forget yourself. You feel part of something larger.”

He goes on to explain that when crafting, the outside body temporarily disappears. There is insufficient attention to focus on hunger, tiredness, pain, anxiety, and other physical or emotional feelings.

This feeling of ‘flow’, elicited through making, can help to regulate strong emotions (Gutman and Schindler 2007). This means that making can help people who suffer from anxiety or depression to deal with their feelings and cognitive crossfires. It can also combat mental diseases associated with aging, reducing the chances of developing cognitive impairment by 30-50% (Geda et al. 2011).

The rewards from making do not stop at the act of creation. The final product can illicit pride, which offers repeat hits of dopamine, and increases confidence to try new things (Wilson 2015).

5.1.3. Modern Day

Today Makers are incredibly diverse. In my work, I engaged with a variety of people from a 90-year-old quilter living in a quaint cottage on the Eastern coast of Prince Edward Island to an 18-year-old transgender woman computer hacker with pink hair living in a community condo in downtown Toronto. Making brings techies and non-techies of all ages together.

Some Makers see their movement as collective action against capitalism. They are reclaiming production and denying the formal economy their participation (Jourdain 2015). By making, repairing, and hacking products, they are interrupting the formal economy. Some Makers also believe that it is important to understand

gadgets and products as a form of power over the capitalist systems. If we hope to have any control over the future, we need to help build that future and know how technology and production works. It comes down to two basic options: 1) be told what to buy through choices presented by companies or 2) make what you want, when you want, and exactly how you want.



Figure 12: Image from Country Grind Quarterly

The hackers extrapolate this to ‘program or be programmed’ (Rushkoff 2011). In my research, I explore the extent to which different Makers adhere to anti-establishment politics.

This kind of politic resonates with those who resent the restraint and monotony of urban and city life. I hypothesize that a lot of rural Makers, preppers, and farmers have this anti-establishment frame of mind. The Country Grind Quarterly (LeBlanc 2014) certainly suggests that there is a diverse crowd looking to tap into rural resistance farming and making. The zine includes a range of topics including harvesting tree bark, making welders out of microwaves, hunting prairie chickens, and essays on isolation and mental health. It is possible that urban Makers share this punk-politic. However, it may be less pervasive. Another example are those participating in the Open Source Ecology farms. In my research I explore the difference between urban and rural Makers, including their reason for making (pleasure or business), their level of preparation for the future, and their views on environmental collapse (optimistic or pessimistic).

The online aspect of making has made it a modern and pervasive movement. An individual can get everything they need to make a product, from the materials to step-by-step guides, online. Wikis share knowledge, platforms sell products, video tutorials teach new skills, material sharing sites give access to free/inexpensive materials, and tutorials for troubleshooting and innovation exist if you’re not quite sure how to do something. This online network functions as a large community. Some Makers see themselves as members of a community in which they actively participate and have shared responsibilities – in this way, it is a re-emergence of a collective unconscious (Kouhia 2015).

However, there are sure to be differences between Makers who choose to sell on Etsy versus those who choose to sell at local markets. Morris and his followers were uncomfortable with modern technology. Much of the literature about modern Makers suggests that this is no

longer the case. I am interested to know if there is now a split between Makers – ones who embrace technology and those who avoid it. Many Makers have embraced technology, but it is unsure if this is required for success as a maker today.

The possibilities for making in education are promising. Studies show correlation between creativity and success in Science, Technology, Engineering, and Maths (STEM) (Root-Bernstein 2015). Making engages kids at an early age in STEM, especially promoting engineering skills (Jordan and Lande 2013). Early characteristics for engineers are practical ingenuity, creativity, and lifelong learning – all of which are leveraged in the maker experience. Educators are beginning to look more seriously at alternative approaches to early education. It has been long known that IQ does not predict success – creativity is often a more important factor (Root-Bernstein 2015). Several Nobel Laureates did not meet the cut-off for genius IQ level, rather they attributed their success to creativity. Santiago Ramon y Cajal – Nobel Prize winner in Physiology or Medicine (1906) said a successful investigator “should possess... an artistic temperament which impels him to search for, and have the admiration of, the number, beauty, and harmony of things” (Cajal 1951). Thus, at the broadest level, creative success appears to be correlated with polymathic ability (Root-Bernstein 1989, 2003, 2009). Studies of scientists have demonstrated similar correlations between their success and various arts and crafts avocations.

I contend arts and crafts should not be treated as dispensable extras in an economy but considered integral parts of education and development producing innovative scientists and engineers. STEM students are far more likely to have extensive arts and crafts skills than average Americans (LaMore et al. 2013). Therefore, early and consistent exposure to arts and crafts (such as making) is necessary for an innovative society. I am interested in how kids view making, if

there is an early interest in STEM or if making is simply fun. I am also interested in the possibility of developing making curriculum for elementary schools as early STEM education. At the private elementary academy of Dunhurst in Hampshire, students are encouraged to embrace making at a very early age. Supervisors involved have seen a re-engagement with process and a desire to reconnect with physical surroundings. Students begin to see links between stuff and consumption as making awakens an interest in materials necessary for building, authenticity, and provenance (Barton 2011).

I also interviewed 9 individuals who may not consider themselves Makers, but making is central to their way of life. This included preppers and homesteaders. Preppers are individuals who are preparing for collapse of civilization by becoming as self-sufficient as possible (Aldousari 2014; Kelly 2016). Homesteaders are also generally self-sufficient, but a societal collapse is often not their primary motivation – rather their ethics and values are to live as green as possible and therefore live on a community farm or ranch (Miller 2015). I also interviewed four members of municipal government in Kitchener and Charlottetown who are involved in local economic development decision making.

5.2. Method Overviews

The primary methodological tools used in my research were interviews and ethnographic observation. I also attempted to employ Q methodology but had too few participants.

5.2.1. Interviews

25 questions were used to guide open ended interviews in Rural Prince Edward Island and Urban Ontario. The interview questions are listed in Appendix 8.1. The set of questions was designed by creating list of 50 questions and focusing in on the most important themes.

The purpose of the interviews is to hear the experiences, opinions, and values of Makers in relation to the themes and topics explored in Chapters 2, 3, and 4. For example, I asked questions about having a ‘bucket list’ to begin exploring making as a hero project. I asked about any potential trade-offs the participants make to be a Maker so I could explore the wicked tensions of low growth. Other prominent themes in the interviews included community, the environment, and rejecting capitalism.

While I attempted to ask the same questions to everyone, it often varied depending on the context. I did, however, always end with the same three questions:

1. What do you get out of this? How does it fulfill you?
2. To what degree does your craft define who you are?
3. What do you value most in life?

The interviews were all approximately one hour in length and were conducted in the participants’ homes, workshops, shops, Makerspaces, and via Skype. All interviews were audio recorded and the transcripts are available upon request both coded and not coded.

5.2.2. Q Methodology

The purpose of Q methodology is to extract subjective opinion about attitudes and to reveal subjective structures and perspectives of participants. This is achieved by ranking a series of statements. Q methodology would have been useful to this research as it probes further into important themes while avoiding redundancy. It also allows the researcher to test participants’ values against their own statements provided in interview. For instance, a participant might be against corporate capitalism in their interviews but when pitted against other value statements their anti-establishment sentiments might be muted.

Q methodology does not report on population statistics, the aim is to sample the diversity of views within a given set of people. It is thus effective when researchers seek to hear many voices and perspectives and to identify what makes each of those voices unique (Cross 2005) and to identify the variety of accounts or discourses about/around a particular theme, idea or discourse (Barry and Proops 1999).

The foundational instrument of Q methodology is the Q sort technique. This involves ranking a set of statements from agree to disagree (S. R. Brown 1996) or along a continuum such as ‘not at all like me’ to ‘very like me’. The result is a model of subjective preference within given discourses. The Q set (rank-able items) usually consists of between 10 to 100 items. The set is placed on cards and the participants are asked to rank them between the two poles. In my research this was completed online. The Q set was determined through a research question and individual and/or group interviews, literature reviews, media outputs or researcher experience. After participants rank the Q set (potentially a number of times with different propositional discourses guiding the process) the sets are interpreted. The interpretation is achieved through comparing and contrasting positions of items between different participants and different discourses. The sorting patterns each tell a story of preference and values of different participants. The sets are designed by either the researcher or in a focus group – in this case I designed the statements out of literature and documents pertaining to environmental and social values and preliminary maker interviews. An initial list of 80 statements was pared down to 45 statements, separated into three separate sorts with a final ranking with the top 15 of the three previous sorts. The Q sort statements can be found in Appendix 8.2.

Advantages of Q methodology include versatility and reach, comports well with concepts of contemporary science, allows for inter-test intervals, respects the integrity of participants,

requires few participants to have statistical significance, can be done anonymously, and bridges qualitative and quantitative research for subjective research questions (Barry and Proops 1999; Cross 2005; Militello and Benham 2010). Criticisms include a lack of reliability (yet maintains 85% replicating consistency), limitations due to pre-determined statements (so should perhaps be accompanied with interviews), risk of bias at the interpretation stage, and participants may attempt to falsify answers (Cross 2005). Q methodology is also very time intensive (Barry and Proops 1999). Unfortunately, I only received 8 Q-sorts from my participants. I initiated contact in regard to the Q-sort far too late in my research process and after too great a length of time since I had last contacted my participants. The results from these 8 Q-sorts were insufficient to make any conclusions but aligned with my work in such a way that I will continue this in future work. While 8 participants would be enough to make conclusions about their individual frames of reference, it was not enough for me to have comparative representation. To do this, I would have required 20-30 responses (Barry and Proops 1999).

5.3. Process

This dissertation brings together over three years of workshops, interviews, festivals, and surveys. Despite such a lengthy study, the process remained constant for all participants. In all cases the participants completed the interview first (if they did one) and the Q sort last, some completed a survey (particularly those in the first year). All participants who completed an interview or a workshop over the past three years were contacted to see who was interested in doing the Q sort (8 agreed to participate, an insufficient number).

The overall process taken was a) obtaining ethics, b) recruitment, c) field work and, d) analysis.

5.3.1. Ethics

This research followed Canada's Tri-Council ethics procedures for research with human participants and minors. It was approved by the University of Waterloo's Office of Research Ethics under two separate research files (one for Quilley's Metcalf study in collaboration with Brock University and the second for my personal PhD research). Particular consideration was given to fairness, privacy, confidentiality, and safety for minors.

Participants received a letter of information upon agreement of participating in the study. At the time of their interview, participants signed a consent form. Alternatively, participants could read and click 'agree' on an online form prior to completing the interviews. There was no additional information or consent provided for the Q sort. Consent from the participants requires anonymity and confidentiality by the researcher. Participants were informed of all data collection measures being used. I received permission to take photos of some participants' homes, products, and workspaces. However, there are none of the participants themselves. The only exception are of the children who participated in the gumball workshop and their parents provided consent for their images to be used in publications, presentations, and my dissertation.

Other ethical considerations arose, specifically relating to community-based research, workshops, and relationship building. My research included building a personal relationship with many of my participants. There is thus consideration needed for a) my potential conflict in opinion with community members, b) ensuring that I maintained respectful boundaries, and c) ensuring a mutually beneficial relationship. Because of the personal and community relationships it was sometimes difficult to get to a deeper discussion of wicked tensions. Discussing the wicked tensions with participants often meant exposing hypocrisy that they were uncomfortable or unwilling to face. Additionally, many of the participants had dealt with mental health issues

and resorted to making as a therapy for themselves. I needed to be respectful of their history and mental well-being. Finally, I grew up close to an indigenous reserve – an important one in the War of 1812 and one that was significantly impacted by residential schools. We saw researchers from universities frequently visit, do their research, and never be heard from again. Thus, my ethical obligations have not ended. I intend to follow up with my participants to share my outcomes and insights.

5.3.2. Recruitment and Sample Size

In his chapter “Sample Size” Patton explains:

“Qualitative inquiry is rife with ambiguities. There are purposeful strategies instead of methodological rules. There are inquiry approaches instead of statistical formulas. Qualitative inquiry seems to work best for people with a high tolerance for ambiguity. ... Nowhere is this ambiguity clearer than in the matter of sample size. ... There are no rules for sample size in qualitative inquiry. Sample size depends on what you want to know, the purpose of the inquiry, what’s at stake, what will be useful, what will have credibility, and what can be done with available time and resources.”

(2002, p. 242-243)

Some qualitative methodologists have presented general guidelines in relation to interviews and case studies, although “case studies are among the most difficult types of qualitative research to classify” (Marshall et al. 2013, p. 13). Case studies are meant to represent a generalized viewpoint of a group of people and are most suitable where “the research data is gathered in natural, real-life situations” (Mills, Durepos, and Wiebe 2010, p. 67). The post-data collection analysis is inductive by nature – it is the researcher’s objective to seek out and reveal unexpected issues in the case study and “testing the theory or the hypothesis is less important than examining the data in a complex and precise manner” especially given that the research for the studies is “selected expediently, rather than through the method of random sampling” (Mills, Durepos, and Wiebe 2010, p. 68). Yin remarks on the case study process:

“In actuality, the demands of a case study on your intellect, ego, and emotions are far greater than those of any other research method. This is because the data collection procedures are *not* routinized.”

(2009, p. 68)

In a general study to survey a geographically enclosed group of participants anywhere from 20 – 50 interviews is recommended (Creswell 2007; Denzin and Lincoln 2005; Morse 2003) and for comparative case studies it is recommended to have at least 2 different sets of cases with at least 5 – 7 interviews per case (Yin, 2009). In any one region, the average sample size for data saturation is 18 interviews (Marshall et al. 2013). A researcher should conduct at least 5 more interviews after they believe they’ve hit a saturation point (Thomson 2010). Case studies “should generally contain 15-30 interviews...69% of all qualitative studies sampled...employed fewer than 30 interviews...top performers, [with] the highest average impacts fell in the 15-30 interview range” (Marshall et al. 2013, p. 20). When applying content analysis, researchers recommend 100-110 content-driven sources for coding (Glaser and Strauss 1967).

I have three clear sets of cases consisting of 34 interviews (urban Makers) which is ~65% more than other studies in 2013; 32 interviews (rural Makers) which is ~65% more than other studies in 2013, and 24 interviews (Makerspace members and event attendees) which is ~47% more than other studies in 2013 (Marshall et al. 2013). Given these figures, the sample size for this study is sufficient for drawing out observations about the case studies and making context specific classification comments – especially on the rural and urban sets of Makers, less so on the Makerspace participants. Forty-nine of the participants are from the Metcalf studies – the percentages in the results chapter do not include the Metcalf studies unless explicitly stated because the process of data collection in the Metcalf studies was very different than my own

individual research. The Metcalf studies illuminated themes and ideas for my individual research project.

Having said all that, these case studies represent very context specific participants, and thus the outcomes contribute to the overall discourse on Makers, not on generalizations about who or what a ‘Maker’ is in any given context. Given the context of the case studies, it does allow for a unique comparison of Makers who live in rural versus urban settings. The rural Makers, given their relative geographical isolation, allows for considerations on how Makers and making contributes to a half informal and half formal economy. Rather than testing the framework presented in Chapter 7, these case studies, along with the literature review, contributed to it’s development. Further testing of the framework is needed.

Interviewees were recruited through a) Etsy group forums, b) community listservs, c) Makerspace member lists, d) festival participants, e) posters at relevant events, and f) craft show participant rosters. In most cases, the administrator of the forum, group, event, or list sent the message out on my behalf.

Local Makers were recruited for interviews via snowball sampling and through the various listservs of the groups. I developed strong relationships with the local maker community and did not do interviews until the final year of the study. I simply sent an e-mail out to my contacts made during the research process.



Figure 13: The One of a Kind Show 2017 Brochure

Prince Edward Island participants were recruited by direct e-mails. I used the PEI crafters guild and Etsy group to target individuals and e-mailed them directly to set up interviews with them. Three additional interviews were booked through snowball sampling.

Those who participated in full-length interviews were invited to complete the Q sort online. Most interview participants initially agreed to participate. However once they were contacted about doing the Q-Sorts, around half responded saying they would complete the Q-Sort but only 8 completed the process in full.

5.3.3. Field work

My fieldwork began with four Metcalf workshops beginning August 8, 2014 and ending November 29, 2014. I did interviews throughout 2015 – 2017. I travelled to Prince Edward Island from July 3 – 23, 2016 to complete interviews with rural Makers in a unique political and economic landscape. In February and March 2017, I interviewed Makers based in Toronto.

1. *Metcalf Workshops*

The Metcalf Foundations Green Prosperity program funded our study *Green Prosperity and the reMaker Society: Integrating the Low Growth Economy and Community Self-Development, Artisanal Skills, and Enhanced Cultural Participation*. This project was conducted by me and my advisor, Stephen Quilley, in collaboration with Rob Gorbet (University of Waterloo), Marcel O’Gorman (University of Waterloo), and Jason Hawreliak (Brock University).

The idea behind the project is that the habit of making things may challenge the logic of passive consumption whilst engendering a new kind of community-based economy. We hypothesized that the convergence of a) new communication and organizational tools (open source wikis and the internet) and b) emerging micro fabrication technologies (3D printing) is

creating possibilities for small-scale, community-based economic activity. This new community based economic activity combines artisanal craftsmanship with technical innovation and the traditional DIY philosophy of recycling, reuse, and repair of objects.

This was a pilot project to test the capacity of community-based maker spaces and projects to engage ordinary people, unpack psycho-cultural attractions of consumerism, change behavior, and transform local economies. I used lessons learned and preliminary results of the Metcalf project to design my interviews and Q set for later research.

a. Workshop 1: Powercube Workshop

We ran the Powercube workshop in collaboration with Open Source Ecology and DIYode in Guelph, Ontario from August 8-10, 2014. In this 3-day workshop participants collaborated to design and build three micro-powercube hydraulic power units. 15 participants learned some basic metalworking skills such as welding, grinding, and cutting. Tom Griffing from Open Source Ecology (OSE) led the workshop at the maker space, DIYode. We have maintained contact with Tom in regard to future workshops. After building the powercubes, we successfully tested them on a log splitter. We gathered some very insightful ethnographic data from this workshop and it helped us forge strong relationships with both OSE and the Guelph maker community.

b. Workshop 2: Sewing Workshop

This two day sewing workshop took place at the Kwartzlab Makerspace in Kitchener from November 14-15, 2014. Nine participants learned to use sewing machines while making Tote bags on the first day. On the second day, five participants brought in a garment in need of mending. This workshop was especially relevant for the project since the ability to make and mend one's own textiles can potentially cut down on both consumption and waste.

c. Workshop 3: Arduino Workshop

In this workshop 12 participants learned the Arduino platform while making wearable computers with Gemma at the Critical Media Lab in downtown Kitchener from November 28-29, 2014. It was led by two Engineering graduate students from the University of Waterloo. This workshop had a wide demographic range as several families took part together. Furthermore, in terms of expertise levels, this workshop was our most diverse. We had established Makers already familiar with Arduino working alongside participants with no prior experience with electronics or programming. Like the Maker Club for Kids workshop, this granted us important insights into how making can act as a family activity.

d. Workshop 4: Gumball Machine Workshop

For this workshop, we partnered with the KW Maker Club for Kids and THEMUSEUM in downtown Kitchener. 38 participants (kids aged 5-12 and parents) took part in this workshop from October 4-5, 2014. Learning why parents get their kids involved in these activities while also hearing from the kids themselves was extremely valuable. The Maker Club for Kids was just starting so the money we were able to give them for hosting the workshop was a significant boost. They were able to purchase some tools they needed and wouldn't have been able to afford otherwise. The Kids Makerspace is still a thriving part of THEMUSEUM holding regular events and workshops for kids of all ages.

2. Prince Edward Island

I traveled to Prince Edward Island from July 3 – 23, 2016 and stayed with a homesteader just outside of Charlottetown, in Stratford, PEI. I gathered participants by targeting members of the PEI craft alliance and through snowball sampling. I also gathered participants by attending the farmer's market and local schools focusing on traditional craft in Summerset. I drove to the

various homes, farms, stores, and workshops of the Makers across Prince Edward Island. In total I had 32 interviews averaging slightly over 1 hour in length.

3. Etsy and Etsy Shows

Throughout the end of 2016 to the end of March 2017 I conducted interviews with Canadian based Makers who use Etsy as their primary selling tool. I arranged these interviews through a general call to the Canadian Etsy group and conducted the interviews on Skype. I also obtained participants through snowball sampling. The average interview time was 33 minutes. I also attended Etsy shows in Toronto, Hamilton, and Waterloo where I met Makers face-to-face and arranged Skype interviews for a later date. Attending the Etsy Shows gave me a better frame of reference for a day-in-the-life of an Etsy maker. 15 of my participants were recruited directly through Etsy online or Etsy shows.

I attended the One of a Kind Show in Toronto in March 2017 and conducted 21 micro interviews with Makers (averaging 23 minutes in length over 2 days). This expanded my participant pool to include people from across North America (there was 1 American participants, the rest were Canadian), and who were invested enough into their craft to a) travel great distances to attend the show, and b) able to afford the high cost of participating in the One of a Kind show. It costs participants anywhere from \$400-1000 to have a booth at the OOKS, depending on where in the venue they want their booth placed (\$1000 gets you the slots closest to the entrance or food stands). Most of the Makers I spoke to at the OOKS were from Toronto or Southern Ontario. These Makers were more established in their entrepreneurial endeavors.

4. Local Makers and cultural immersion

Whenever a local maker event happened, I attended. From 2013 – 2017 this has included yearly Maker Expos in Kitchener, regular repair-a-thons at the Kitchener Public Library, Tuesday drop-

in nights at the Kwartzlab maker space, repair Cafés on Sunday afternoons co-hosted by Kwartzlab and TransitionKW, monthly Sew-A-Thing-A-Thons at rotating locations, volunteering with the Mindful Maker's camps and events at various locations, monthly 3D printing meet-ups in Kitchener, organizing a DIYfocused festival at the University of Waterloo, and attending other various workshops and events with making as the focus. I didn't attend each event regularly over the past four years, but attended many of them, enough to consider myself a part of the Kitchener-Waterloo maker community. At these events I participated fully while also observing other attendees, and thus in my analysis there will also be elements of ethnographic observations. I conducted formal interviews with 24 participants at these events and venues.

My immersion into the local Maker Culture has provided me with unique insights into this group of people and exposed the cultural phenomena of this portion of society. After involvement with local Makers for three years I decided to do a comparative study of Makers in a radically different environment (rural Prince Edward Island) to see if the kinds of political sentiments are present in both contexts. I have not included any of my conversations with the Makers at these events in the content analysis as none of them signed ethics forms. Instead, I will draw on this experience in my analysis. It was an integral piece of my research, as it helped me see the way Makers think, act with one another, and form relationships over time.

5. Other Interviews

a. Culture PEI

Through one of my participants in Prince Edward Island I was given access to the executive director for Culture Prince Edward Island. The purpose of Culture PEI is to improve the income of cultural workers including writing and publishing, crafts, digital media, film and television, visual arts, music, performing arts, museums, libraries, archives, and heritage. They engage with

businesses and the government to help grow the skills of cultural workers and to help grow the creative economy of PEI. I met with the executive director in the headquarters of Culture PEI to discuss the role of craft and the informal economy in PEI.

b. Make Kitchener

In March 2017, Kitchener, Ontario launched the “Make it Kitchener” four-year economic development campaign. This campaign highlighted the Makers of Kitchener as innovative and making Kitchener a city for tomorrow. This is a quote from their website:

“Our city is propelled by entrepreneurs, investors, artists, machine operators, chefs, agents of change, and so many others. Our four year economic development strategy is about making Kitchener an inspiring place to be, whether you’re launching your business, building your career, or supporting your community.”

In this economic development plan Kitchener is focusing on entrepreneurship and “more time connecting and less time commuting” by making dynamic communities within Kitchener.

They set out three objectives:

1. Support creative experimentation.
2. Encourage the intersection of art and industry.
3. Support creative clusters such as music, film, performing arts, and design.

Their strategy for meeting these objectives is to a) support Maker Culture, b) expand support for maker events (such as the Maker Expo), c) explore options for more maker spaces, d) support investment into community tools such as 3D printers and tool libraries, e) support programming for digital literacy in girls, f) support hackathons, g) expand funding for artists in residence programmes, h) sponsor skill development workshops, and i) support professional development.

In their online strategy document, they say: “The Makers. The hackers. The writers. The coders. The builders. The creators. We dedicate this to you”.

Suffice to say, the economic development goal for Kitchener is consistent with the themes explored in my research. Therefore, I reached out and interviewed the head of the economic development strategy. I interviewed two people on the team, one who was the lead of the project and a support member.

5.4. Content Analysis

Content analysis is a methodological tool to interpret qualitative data. Given that my research spans over such a long period of time and that it includes a) specific sets of data that should be considered both as separate entities and as a collective whole, and b) a variety of sources of data, I use NVivo content analysis software to bring the various pieces together to recall relevant themes and information. NVivo itself is methodologically agnostic – simply a tool for organizing data.

I transcribed my interviews in MS Word, took screen shot images of my Q-results, typed up my reflective journal entries, and saved some interesting and relevant news, blog, and videos in a Chrome folder. I then inputted this data into NVivo. I kept the data sets together as they were presented above so I could look at specific phenomena in PEI versus Canada versus Kitchener, and to see all related themes at once. I then added thematic coding to all data.

Thematic coding is a widely-used approach to qualitative analysis. I used NVivo to easily recall the interviews and data related to certain frames by performing text queries and pulling up all related data to a theme at once. Throughout section 6.3 I present a number of percentages. These percentages were found by doing text or theme searches in NVivo, ensuring the results

were relevant to the question at hand, and then manually calculating the percentage based on the number of participants. Most of the percentages in section 6.3 are the PEI participants and the Toronto participants (32+34=66 or 43% of total participants), unless otherwise stated.

When relevant, I mention that I include all non-Metcalf participants – this also excludes the city officials in the percentage for a total of 99 (64% of total) participants. I also qualify that I am including all participants except the Makerspace participants for a total of 75 (49% of total) participants. I do not rely on percentages for the Makerspace participants because many of the interviews were group interviews (up to 11 participants) and it was too difficult to recall or ascertain from my data exactly how many people in the group agreed with the statement.

In general, the percentages should be taken simply as reference points for the approximate number of participants that might agree with a statement or should be included in a conclusion. I included the percentages to more firmly back up the statements I make regarding the themes. However: some of the interviewees I spent entire days with but only included their interview and therefore they may have agreed, but it's not in the data sets. Or, the interview might overstate the amount that a participant might agree with something. Because a significant portion of my insights have been formed by my ethnographic interactions with my participants, I do not rely solely on coding in my discussion chapter. I use the coded material, case study observation experience, and literature reviews to discuss ideas and themes. Mainly, I use the coding simply as an assistant for recalling all relevant moments where a particular theme occurred during my research.

I coded in 16 themes, all with 3-15 subthemes, which I used as a reference tool during my discussion chapter and to perform text search or theme search functions to easily recall information from the field. Overall, I don't utilize NVivo to any great extent other than to help

alleviate my memory's bias. NVivo was helpful for reducing that bias – given the nature of the research eliminating the bias entirely was impossible. Also, given the research and methods used the purpose is to introduce stories from the field and apply it theoretically to ecological economics, not to make any definite conclusions.

6. Results

This chapter is divided into three main sections: 1) who the participants were and characteristics of the subgroupings, 2) outcomes from the Metcalf workshops which informed my approach for my personal study, and 3) the content from the interviews that matched themes of interest and themes that emerged during the research. I also mention some of the preliminary results from the Q-sorts.

6.1. Participant Characteristics

Participants in the study, not including the Metcalf workshops, are broken down into four subgroupings: rural, urban, Makerspaces, and ‘other’, shown in Table 6.

Throughout the results chapter I will refer to participants within these groupings. It is worth noting that some interview classifications (i.e. City 6) were conducted with more than one person. This is relevant when calculating percentages. For example, in section 6.3. I group 4 city interviews together, this logically equals 22.2% of participants. However, it is actually 38.8% of the urban participants because these four interview files have a total of 7 participants in them. This is why there are 9 prepper and homesteader participants but only 7 interview files associated with them. In instances where opinions differed greatly in relation to specific or important themes in the interview groups, I split the interview into separate files for participants. I have included the NVivo file names for each category on the fourth column of Table 6 and noted the ones that have more than one participant in the file with a bracketed number following the file name.

Table 6: Breakdown of Participants

<i>Category</i>	<i>Participant location</i>	<i>Number of Participants (% of total participants)</i>	
Rural	Prince Edward Island (various)	32 (21%) (9 [5.9%] preppers and/or homesteaders)	PEI 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 21, 22, 24, 26, 28 Preppers and Homesteaders: PEI 12, 20, 18, 25 (2), 29, 30, 31 (2)
	Rural Southern Ontario	4 (2.6%)	Rural 18, 20, 26 (2)
Urban	Online	2 (1.3%)	City 14 (2)
	Toronto	34 (22.3%) (21 [13.8%] One of a Kind)	City 4, 5, 6 (4), 7, 8, 9, 11, 13 OOKS 1 (2), 2 (3), 3, 4, 5, 6, 7, 8 (2), 9, 10 (5), 11 (2), 12
	Windsor	3 (1.9%)	City 10 (2), City 12
Maker Spaces	Kwartz Lab Members	24 (15.7%)	Makers 1 (11), 2 (7), 3, 4, 5 (4)
	DIYode Members	(Significant overlap in the participants. I would see them at various events.)	
	Other (workshops at Kitchener Public Library) Metcalf Workshops	49 (32.2%)	Not referred to in text.
Other Material and People	Messages boards	These sources were used to get a sense of the culture and design themes/questions.	City 1 (2), City 2, City 3 – referred to in text as “Culture PEI” or “Make it Kitchener”
	YouTube		
	Facebook groups		
	Culture PEI, Kitchener Government	4 (2.6%)	
Total		152 (100%)	

The percentages are also imperfect because the degree to which a participant might agree or disagree with a statement is subjective – however, I would code it as one way or the other, unless it was significantly in question. This skews the level to which the percentages represent the true opinion of the group of participants. To deal with this, I include quotations from the interviews to add nuance. The percentages should be taken lightly and considered only as a

reference point for the number of people I'm talking about, not as a perfect representation of the opinion of the participants.

6.1.1. Online/Urban General Characteristics

There was a huge variation of discourses in this study, suggesting that someone who participates in Maker Culture is not necessarily a certain kind of person. This is encouraging, because it suggests that Maker Culture has wide, and potentially mass, appeal. However, one factor did account for a major split in differences between two groups. The urban and rural participants varied greatly from one another, with similarities amongst their own group, on topics of technology, science, community, family, freedom, extended empathy, and the meaning associated with their craft. Even when comparing groups of the same age, the values and interests were consistently different between the two groups.

The online and urban interviews included participants from Kitchener-Waterloo, Toronto, and Windsor. At the One Of a Kind Show (OOKS), participants were also from Montreal, Vancouver, and Winnipeg. One OOKS participant was from California. The average age of urban participants was 28 years old, 77% were unmarried, and all but two couples were childless. 100% of the urban participants relied on Etsy for the sale and distribution of their goods. None of the participants did crafting primarily as a leisurely activity, they all took it seriously as a primary source of income if single, or secondary source of family income if in a domestic partnership.

The OOKS may have skewed the results as these were some of the most successful crafting entrepreneurs across Canada. To account for this, within Nvivo I included OOKS participants in their own separate case study category and ran queries both including and excluding this group of participants. The outcomes of this were insignificant; the motivations and

interests were the same or similar to those in urban settings that were not at OOKS. However, running queries based on materials used (woodworkers versus clay artists) showed some indication that woodworkers are more interested in themes of ecological economics, political instability, and self-sufficiency. For example, 100% of preppers and homesteaders also identified as woodworkers. Additionally, 9.5% of OOKS participants used wood as their primary medium. These same 9.5% were the only ones at OOKS to discuss themes of systems transition. OOKS 4 stated:

“With this new generation there is a sense that working for a company isn’t quite ‘enough’. They want their voices to be heard, to be creative and to really find meaning in the work that they do. It’s a good combo because I think we’re going to see a change in the Canadian workforce in the coming years. More Makers and more small-scale production”.

In a similar vein, OOKS 9 said:

“If you don’t know what an ‘externality’ in economics is, go look it up. It basically means that that \$1 plastic piece of shit you just bought, should actually be costing \$500. So, they’re using whatever they want, not paying for it, and not even making the consumer pay for it because they don’t have it”.

None of the other interviewers at the OOKS expressed similar sentiments. 19.1% of the OOKS participants did have social justice undertones (this percentage includes OOKS 9 and 4).

Urban Makers were less concerned about ‘ethical’ making practices. Their opinions on multinational corporations such as Walmart ranged from apathy to mild displeasure, with only one participant calling multinationals out as a problem. Only 9.5% of urban Makers indicated that their materials are usually ethically sourced (socially or environmentally). Avenues for sale of their items did not include local markets and community events, again this could have been skewed by OOKS participants. Only 7.6% of urban Makers sold their goods offline at markets.

Urban Makers were generally less reflective on making as a form of resistance or to improve mental health. Mental health only came up in one urban interview. They were more

likely to discuss the importance of artisan craft in people's home to bring meaning back into design, consumerism, and objects. For example, while only 13.8% of rural Makers reflected on the need for craft to increase design aesthetic and beauty inside of people's homes, 71.7% of urban Makers remarked on these topics indicative in the following quotes:

"I feel like calling something "art" is really just a subjective way of indicating value—which could be aesthetic, cultural, monetary, and so on. My making is art" (City 4).

"I'm trying to capture, in my language of making, the things that I see and feel, as a way of recording their beauty and power" (City 5).

"Making brings the aesthetic back into life and product development, too" (City 12).

There was little interest in this group on topics such as environmental degradation, political instability, and future preparedness. In a text query for the terms "environment, politics, collapse, future, prepare, pollution, ethical", including stemmed words, 36% of rural interviews came back as positive (and context appropriate) while only 12.8% of urban interviews came back positive.

The community aspects to craft and making were important to urban Makers, but only to the extent that another maker functions as an extended friend network. Table 7 compares the comments made by urban versus rural participants on the topic of community, friends, and family.

There was little indication of reliance on other Makers for success or as integral units of friendship, whereas the rural participants were more concerned with community and sharing. This could be less of a function of the urban and rural divide, and more of a function of mainland versus East Coast divide. Canadian East Coasters are stereotyped as being 'friendlier' and there are far fewer people so they're more likely to build a community with one another.

Table 7: Role of community in rural versus urban participants

Urban	Rural
"I like coming here to see my friends" OOKS 7	"My family is definitely important to me. My making friends are part of that." PEI 11
"Crafting is and isn't about community. When you first start it's more about anonymity, than anything." City 12	"The craft community is really lovely here. Whether it's because I love craft, I always buy craft for gifts, so you get to know the community." PEI 12
"And maybe that's fine, but like go to a bar or a church or something. Making isn't a community event, it's a solitary activity." City 6	"Really, we should be focused on how we contribute to our community and relate to one another, not how we can be our most successful individual self." PEI 17
"I like the maker spaces because I have access to equipment that I can't afford and there are people there to teach me how to use it. We don't socialize beyond that. It's not really about friends." City 7	"Family means a lot to me. The way the economy is right now, family gets put on the back burner." PEI 16
"But I mostly do it for the community. When you are a maker you can end up in your studio for days at a time, so its really great that we have more events like this and more maker spaces emerging." OOKS 3	"There is a very strong community in making, at least here. I think there are different groups of Makers. Those that make as a way of life, those that make as a curiosity and hobby, and those that make to make money." PEI 14
"This shop is a family venture. It brings us all together." OOKS 6	"It's [community] the most important piece. Well, that and being creative." PEI 3
"Our whole community is inside the computer, and we don't have people in the real world. I am alone here, my community is on the box. I have to be on it." City 11	"I go over and help them shear. I go over because I love the smell of it and the community process, when the spinning group hears that someone is shearing we go and help because you need the hands." PEI 2
	"That community is important to me. I have pulled back a little bit, the first years I was here I was very involved." PEI 1
	"When you're just starting out you need the expertise of people who are there, can't afford your own machines, and you benefit from the community, it gives you more of a purpose. I know that community is out there, so I go see them when I need my people fill or to explore new ideas or see what they're doing, but I think once you become a professional maker, not just someone tinkering, then the community is great benefit, but not as necessary, at that point they become a family. You know, you need family but you don't always need to be with them." PEI 8
	"The community of Makers, we have cocktails all together, we have a really special dynamic and we can teach the younger girls and its nice that I am experienced enough to have advice and they have innovative ideas. They are my primary social life." PEI 6

Rural Makers rely less in the use of technology for the success of their craft and business, are more scientific in nature, care more about community and family, care less about their freedom or have a different definition about what freedom means to them, extend their empathy to a smaller geographic region, have more meaning associated with the habit of crafting (not necessarily in the actual product), and often turned to craft as an escape from modern society.

On the complete flip side, urban Makers rely heavily on the use of technology for the success of their craft and businesses, tend to believe in pseudoscience, care about community only to the extent to which they are their friends, care a great deal about freedom, have a wide and global empathic circle, have more meaning in the product of their craft than the process, and use crafting as a way to associate with society.

Make it Kitchener suggested that there might even be a clear divide among urban participants. The City of Kitchener conducted a survey with thousands of participants. The participants were asked to prioritize a list of five things that they cared about in their community. The list included: 1) experience, 2) restaurants, 3) shops, 4) community, and 5) innovation. Community ended up 4/5 overall, but when it was broken down by geography, the suburban areas ranked community last, and those in the central urban areas ranked it first. The City of Kitchener doesn't assume this is because the suburbs don't value community, but because it is the reality of life given that these communities more often have steady jobs and larger families. The representatives said:

“There is a polar difference between the downtown and the burbs. There is a different desire for community. In the burbs, people are in the rat race. We work long hours, we have kids in a million programs, when do you actually have time to engage in community? So how do we as a city either effect that cycle or work within those networks and neighbourhoods to be part of communities? Making does bring people together, but when you work all day,

cut your grass, feed the kids... that's not what you want to do in the evening. Unless we can start bringing it to their communities more often".

Since this interview, the City of Kitchener has started providing community grants up to \$20 000 for any community to do a project such as a community garden, park area, bench, etc. as an attempt to encourage community in the suburbs.

6.1.2. Rural General Characteristics

Participants from Prince Edward Island, all preppers, and all homesteaders live in rural settings.

The average age of rural participants was 68 years old, 97.2% were married or in a long-term domestic partnership, and 97.2% had children. Most rural participants do not use the internet as a means for selling their goods or for success in their work. Only 5.5% have an active Etsy shop and an additional 5.5% sell their goods on their personal websites. 36.1% of rural women gave birth and turned to crafting as a hobby while staying at home with their children and never returned to work.

Rural Makers demonstrated greater interest in the kinds of themes that urban Makers had little reaction to. 22.2% of rural Makers are committed to ethical making practice, 23.7% have an extreme dislike of multinational corporations, 100% sell at local and community events and 87.8% turned to making to combat their mental health issues (mainly depression and stress).

While 100% of urban Makers participated in little to no bartering and/or trade, 36% of rural Makers had various trade relationships in their community. Some would trade raw materials that they themselves sourced (sheep's wool) for other necessary materials for their crafting (dyes). Some would trade their final products for another person's final product or for locally produced foods.

These networks of trade among rural Makers increased the importance of community. Rural Makers rely on one another for success and sometimes see one another as extended

members of their own family. In two instances I was inside the homes of two new mothers; their homes had been outfitted with needed infant and toddler goods from others in their community such as toys, blankets, bassinets, cribs, and clothes.

6.1.3. Maker Event Participant General Characteristics

Makerspace participants include those present at the Metcalf workshops (32.3% of total participants) and those who I met while attending making events at Kwartzlab, DIYode, and making events at the Kitchener Public Library (15.7% of total participants). There is a very wide range of characteristics of these Makers given that workshops attracted different crowds of people. Based on our surveys, those attending Makerspaces often have a degree from higher education, care about the environment, and find personal satisfaction in making. Most of those at Makerspaces do not sell their produced goods and participate in making as a hobby rather than a necessary source of income.

All participants at KPL maker nights were attending the workshops to meet new people, to learn how to fix broken objects because of frustration stemming from easily breakable goods, or found making to be a relaxing hobby. Regular members at the Makerspaces held similar sentiments. They enjoy the community aspects of being part of a Makerspace, find making to be rewarding, and enjoy the sense of pride that emerges when they fix something rather than buying new, which is evident in some of the following quotations:

“You feel a sense of pride in what you've made – not that some factory has mass-produced a phone, or a company that has made something. If you make something, then you have done something.”

Makerspace 2

“Plus, she’s always so proud after she completes something. I want her to be proud of sewing a really cute doll, not proud of getting an arbitrary grade at school.”

Makerspace 3

“You can say "look at this" and it's something you've made. That feels good.”

Makerspace 4

“I am making the hooks, the jump rings, and most people wouldn't bother. But for me, it has more meaning and I do it with intention and then you can be really proud of it. The more handwork I put in, the prouder I am.”

Makerspace 1

Those at Makerspaces did not demonstrate any consistent tableau of political or social views – there was a wide variety of opinions on all topics discussed before. There was a lot of recycling of goods (broken toasters abound) and 12.5% recognize that their hobby would be a disruption to the economic or political system – only two (8.3%) participants thought it would ever amount to anything significant.

One clear and shared opinion among these participants is that it would be good if more people were Makers and they hoped more people would join because of either a) good feelings elicited by making and b) as a way to recycle and repair rather than buy new. Additionally, there is an unspoken culture of ‘free’ and ‘open source’ among Makerspaces. Within Makerspaces there is often a binder with people who are experts at using certain machines so those seeking to learn can find that person. There are often online wiki's with ‘how to’ tutorials and step-by-step guides or documentation of projects that other Makers have done. While they don't necessarily trade good with one another, they are very liberal about sharing materials and making the most out of everything in the Makerspace.

6.1.4. Other

The only interviews conducted outside of these categories were with government employees working on local economic development in Charlottetown and Kitchener. In Kitchener, the focus was on the ‘Make it Kitchener’ campaign which attempts to encourage entrepreneurship and

encourage making in children and education. In Charlottetown the focus was on ‘Culture PEI’ which seeks to incorporate making, crafting, music, and other cultural activities into the economic success rating of PEI.

6.2. Metcalf Outcomes

We gathered data at all Metcalf workshops including surveys and some interviews. The small scale and rate of participation involved in such a pilot project meant it was difficult to draw strong conclusions. However, we did find interesting preliminary results that informed the way I approached the rest of my independent research program. After analyzing the data collected from the workshops we found a number of results that warranted further investigation, keeping in mind these results are from a small sample (49 participants, or 32.2% of my overall participant base):

- 1) Preliminary results indicated that maker events open to the public attract people who do not self-identify as “Makers”. 33% of participants did not self-identify as Makers in the questionnaires given after the workshops. This is encouraging since making activities can only have transformational effects if a large percentage of the population participate, i.e., not Makers alone. When attending events at the Kitchener Public Library and the local Makerspaces I would always ask who in attendance (24 participants) considered themselves Makers and if it was their first maker event. 71% did not consider themselves Makers before the event. Results of my larger independent study concur that maker events attract those who do not self-identify as ‘Makers’ and that participation is on the rise – both governments believed that making is a strong subgroup to tap into because of its rise in popularity. OOKS participants also thought that their show was growing. An increase in making events could contribute to a larger transformational process that is appealing to a wider community.

- 2) 79% of respondents in the Metcalf studies claimed that they “care about the environment,” and 81% wrote that they try “to make environmentally friendly choices.” In my independent research, I focused on the extent to which participation in making provides a more compelling and self-actualizing vehicle for such choices than, for instance, simply restraint in relation to consumption. The preliminary results from the Q-sorts indicates that Makers do not actively care about, or consider important, their rate of consumption. However, as a by-product of their activities they do tend to consume less because they are more likely to repair or recycle their goods. Also, those involved in strong maker communities, such as the participants in PEI, tend to reduce consumption by actively participating in bartering, sharing, and gifting. This observation is based on my interviews and observations of Makers in PEI and Southern Ontario – 66% of these participants indicated in some way that they attempt to reduce their consumption, or I observed consumption reduction methods in their home.
- 3) Just under half (46%) indicated on a five-point Likert scale very strong and strong disagreement with the phrase, ‘Owning the latest gadget makes me feel good about myself’.” This may indicate that people who participate in making activities are less likely to look to consumerism or ownership to satisfy psychological needs, such as self-esteem and feelings of belonging. However, further research with control groups is needed to better understand this finding. In my independent study, there was a resistance against digital technology by 80.5% of rural Makers, but not by urban Makers. 100% of urban Makers were interested in having the latest gadget or relied on their technology to thrive as Makers (i.e.: online stores). None of the rural participants relied on high-tech gadgetry or the internet for the success of their work – this was not always reflected in the interviews, but was supported in the tours of their workspaces. They would use kilns and saws, but not 3D printers, design software, or online

supplementary materials. All but 2 rural Makers did not sell their goods online, only at local craft shows and faires. Preliminary results from the Q-sort (all with rural Makers) indicate that they actively dislike new technology and think that technological innovation makes the world more of a worse place, than a better one. My interviews did suggest that Makers do obtain self-esteem through making and do consume less than others (this theme is explored further with quotations from the interviews in the following section). It is still unclear if this is a strong relationship that has to do specifically with making, or something else.

- 4) The Metcalf workshops tended to be quite demographically homogenous (notwithstanding the kids' workshop). Although 34% of overall participants were women, individual workshops were heavily skewed in relation to 'traditional' gender roles: the metalworking and Arduino workshops were dominated by men; the sewing workshop overwhelmingly attracted women. A lack of gender diversity is typical in Makerspaces and continues to pose challenges for Maker Culture as a whole as women do not feel welcomed. If half the population feels unwelcomed in Makerspaces and at maker events, it is difficult to argue for its mass appeal. However, women were more likely to go to other events such as knitting, sewing, and pottery, so this may even out the gender differentiation. This raises some questions regarding whether or not this is a reflection of gendered interests, if it is culturally skewed, or if different forms of making are simply more appealing to women (sewing, knitting, cooking). Addressing this gap will be a point of focus for future research. In contrast, the participants for the larger study were almost all women working within all of these various areas of making. I speculate that this could be due to women feeling less confident to attend workshops that were outside of traditional gender norms (metallurgy, woodworking), but when women become professional or hobbyist Makers, they are more likely to challenge these stereotypes as they

build their confidence. I significantly explore the role of women within my theme results and my discussion chapter.

6.3. Themes

In this section I will explore and define themes based on participant quotations and discussions.

A total of 15 main themes were included in the coding process to relate to a new approach to the ecological economic social sphere. The themes were partially generated before the case studies were conducted as they were areas of interest or themes presented in the literature. Other themes partially emerged during the interviews. The dominant themes generated in NVivo include: a) discussions of an alternative economy, b) countercultural sentiments, c) how craft has changed, d) the role of education, e) general commentary on the economy, f) making as hand and brain reintegration, g) making as solitary, h) making as community, i) discussions on religion and spirituality, j) questions around political and social resilience, k) self-esteem in making, l) how making is ‘special’ and m) discussions of the special role of women and family in relation to making. I also coded for any discussion of things that might fall into the realm of the social sphere in general and any time a participant discussed wicked tensions. After NVivo identified these significant themes, I consolidated them into four overarching themes: 1) economics and government, 2) community, 3) social change, and 4) wicked tensions.

Running a query in NVivo demonstrated that the thematics were only sometimes consistently present among subgrouping clusters, as demonstrated in Figure 13. Given that NVivo is strictly building these relationships on the number of themes coded in an interview, there are some inconsistencies. For example, City 1 is grouped with PEI 12, 1, 2, and 5; this is because City 1 is a city official commenting on various aspects of PEI culture and community. PEI 21-24 are grouped with City 10 and City 12 who are both from Windsor, ON. They are

grouped together because City 10 exhibits libertarian views that are similar to preppers and homesteaders (as seen on page 130) and City 12 talks a lot about religion and internalizing care, which is consistent with the preppers and homesteaders. PEI 16, 8, and 9 are also grouped with several city participants and the OOKS participants. These PEI interviews do not have much coding in them but some of their characteristics are similar to city participants such as less scientifically inclined/oriented and less concerned about issues of freedom and government.

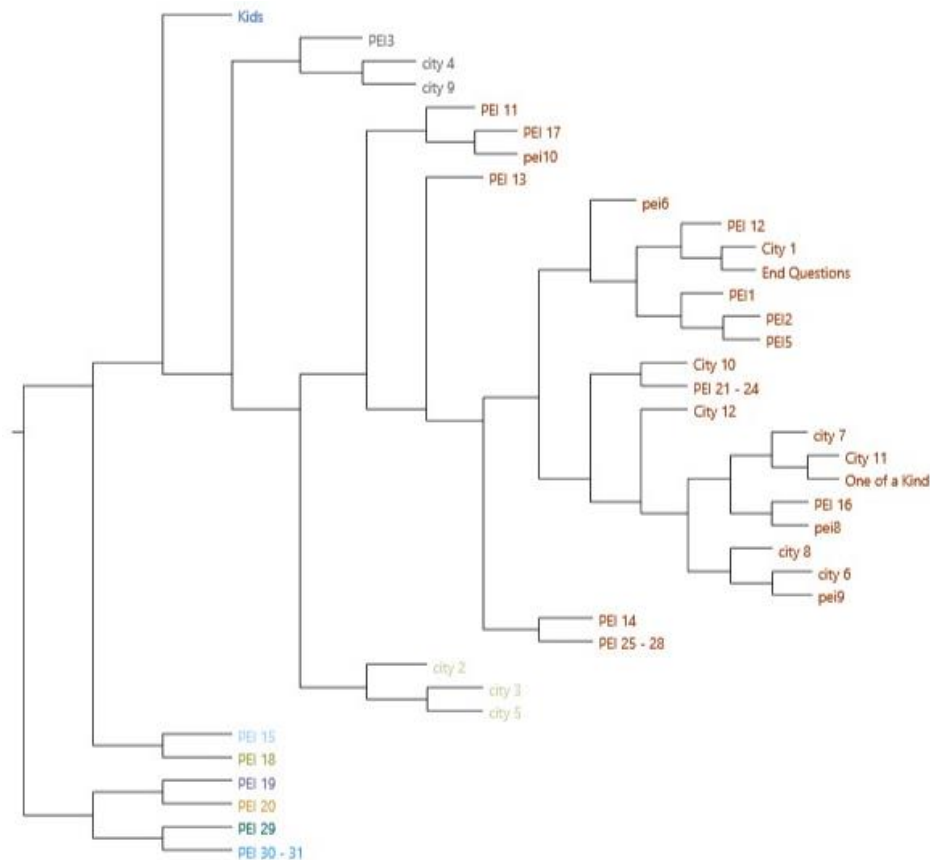


Figure 14: Sources clustered by word/theme similarity

In this figure, the clusters of participants are those that shared the highest number of thematic similarities. The leaves of the tree are not representations of specific themes, rather, NVivo has clustered together the participants who have the highest number of similarly related themes in their coding. The thematic groups are not strong, except for Rural participants in

interviews numbered PEI 15, 18, 19, 20, 29, 30, 31 – which is entirely comprised of rural Makers, preppers, and homesteaders. This means, those living in rural PEI (15, 19, 29, 30, 31) or Southern Ontario (18 and 20) were more likely to have the same opinion as one another than those in a different context. The other subgroups have many variations and points of departure. For example, there are some that were most interested in family community and are thus grouped together (PEI 10, 11, 13, 17), while others focused more on making as an alternative economy (PEI 14, 25, 26, 27, 28). Thematics among 29.1% of urban participants living in a city with a population of 300 000+ (City 6, 7, 8, 11) are very closely related with those at the One of a Kind Show as they are all clustered closely together.

6.3.1. Economics and Government

Participants discussed economic and political structures in different ways. Some were very countercultural calling for limited governmental interference in their life. 31.5% of participants voiced dislike and distrust of multinational corporations and a significant number (87.8%) of participants from PEI intentionally removed themselves from mainstream culture. 30.5% of those individuals did so by moving from Southern Ontario to PEI to reduce their stress or to improve their mental health – specifically depression. This was a highlight of one interview with two government employees in PEI:

“There is a common narrative of people moving here from Ottawa or Toronto and they come here to find a slower life. This is very common. We’re trying to figure out why PEI is the place they run away to. Why is it attractive? There is something about the place that is attractive, I really want to find out. I can guess, my guess is that there is a perception here about lower cost of living. There is recognition of the pursuit of the quality of life, that is embedded here. If anyone did the math, if you’re looking for economic opportunities, it’s not the place to be. There is an agreement with people here that if you’re here, you’re giving up economic activity for quality of life. No one here will live in Toronto, commute 1.5 hours, just to pay a mortgage. Even though paying a mortgage might be a cleverer move, economically, there is an idea here that that is not what life is about. It’s also a vacation destination, people think it’s a vacation forever, until the two-meter-high snow comes at winter.” (City 1).

PEI 11 was an accountant for four years, she hated it and ended up with debilitating depression. She quit and moved to PEI to be a potter where her depression quickly dissipated. Another (PEI 1), was a software analyst for 19 years before quitting due to stress and depression. She also moved to PEI to become a potter, and her life drastically improved. One participant reflected on life after she began a new career and stopped making and quickly became depressed. She “wasn’t on the mend until [she] started making again.” (PEI 6). She continued, saying “I tell all these young mom’s – do not under any circumstances stop making. It’s not only good for your life, but for the life of your children”.

On the other hand, Makers in the city tended more toward making for financial self-security (23% of urban participants) or had no opinion on mainstream establishments, the future, or activism (i.e.: members of maker clubs). Only 12.5% of members or participants in the makerspaces commented on the activist nature of their hobby. All participants in my individual study were asked their age range (34 or under and 35 or over) and if they had children. 100% of participants with children or over the age of 35 (38 participants or 38.8% of total participant numbers), regardless of occupation or location, recognize a need for change in larger establishments. This is demonstrated through sentiments regarding education and about wanting a better future for their children.

Preppers and homesteaders were especially critical of multinational corporations and the lack of the Canadian government’s ability to control fallout after major environment, political, or economic collapse. They believe that there is a “failure of democracy in modern society” (PEI 20) and that “there is a lot of greed” (PEI 18) especially on the part of corporations. There is a 77.7% consensus among preppers and homesteaders that politicians only pander to corporate interests and that when we vote people in, we’re not really voting for a person but for a

corporation (PEI 30). Two preppers argued that making and learning how objects work is in direct defiance of corporate and government control because:

“if everyone understood how their computer was put together and how to fix it then we could reduce a lot of waste and would see a leap in technological innovation. But instead, corporations and governments want the black box firmly shut and locked because it is easier for them to make money” (PEI 31).

This sentiment was continued in an interview with another prepper who suggested that “if you want to really say fuck you to corporations, learn how to make what they make and fix what they want you to just replace. That would really screw up their bottom line” (PEI 30). One homesteader stated that it is extremely important to her to “undermine these companies” because if “you look at all the bad in the world, even terrorism, we can link it back to corporate greed and the deterioration of the environment” (PEI 18).

When interviewees were asked if there is a failure of democracy in Canada, 42.0% of participants agreed. This ranged from the belief that it had simply “not been applied properly” (City 10) and that the government is deliberately skewing democratic processes for profit (PEI 10, 20, 25, 30, 31). At least one believed that there was too much of a “focus on the finances, so you don’t hear anything else but the voice of the rich” (City 8).

Given the quotes and data regarding multinational corporations, specifically Walmart, there is clearly frustration among Makers regarding the pervasive influence of corporations. Yet, in their Q-sorts, the rural participants ranked undermining corporate interest as very low on their list – but their highly ranked values may undermine these corporations indirectly (bartering/gifting, family first). This suggests that while some Makers might have anti-establishment sentiments, they are unlikely to play an active role in advocacy against corporations and instead live differently as a way to avoid them.

Despite some participants having discontent, very few participants were willing to recommend, or even postulate, about potentially new economic approaches. 11 (16.7%) participants suggested a shortfall in our current economic system in its undervaluing of work that increases social benefits and quality of life.

Two participants were willing to share their vision for an alternative economy. The first presents a classic downshifting vision and the second is a progressive modernist vision.:

“If we wanted to maintain some aspects of the modern world, we’ll have to have people that are invested in modern processes like making syringes. So maybe like, 20% of people are still engaged in creating these modern things. There might be less discovery, just maintaining our medical knowledge. So, then there might be 80% of people doing food procurement through foraging and small-scale agriculture. Those 80% of people would need to do it to support everyone else who was keeping other parts of society going. Or maybe time sharing, 50% working in a factory and 50% in agriculture.” (Rural 26)

“The economy is always shifting, there is no ‘new economy’. The kinds of jobs that existed years ago – like wagon wheel repair – don’t exist anymore and there will be new things that we can’t predict. We need to just think of different ways that people can be fulfilled in their lives. There is a bit of a parallel – the Al Gore mantra...people are always going to consume, what we consume and why we choose to consume will shift, but we will always consume something – experience, or products, or whatever. This isn’t about shutting down the industries, it’s about creating new industry and responding to climate change. We can create economic growth in a new way. Someone in a maker space might find something new. It’s the different kinds of jobs. There is a design firm that is trying to create modular products, and they started with a toaster. You just order the part that breaks down, it’s recyclable and reuseable and designed to last. We’ll still need toasters and people to manufacture them, but now we might have more people doing repair work and creating new modular pieces. We will consume, we’ll just consume differently.” (City 8)

The sentiments in these two statements is representative of a split consistent among participants from government organizations, the city, and who utilize Etsy, versus participants from PEI and other rural locations. 56.5% of participants expressed, to varying degrees, that the future is uncertain, and we can’t continue to create economic growth in the same way that we have. For example PEI 4 said “times are changing and we can’t rely on the grocery store or calling a plumber”. Those from a rural setting are more willing to imagine a different way of doing things such as blatant reorganization of social life (as displayed in the above quote),

reemergence of gifting, emphasis on the sharing economy, limiting consumption, and supporting local development. PEI 6 said she relies “heavily on trading and sharing with my neighbours”. While those from urban settings emphasize that ‘business as usual’ will work with some modifications, City 7 said “we’ll need new entrepreneurial jobs that will focus on things like local solar panel production and localizing access to the internet”.

Regardless of what the larger economy looks like, some participants suggest that there is “no scenario where it’s a bad idea to know how to use your hand” (Rural 26). Others elaborate on this saying that Walmart (specifically mentioned by 22.3% of participants in completely different settings) and other multinational corporations are unsustainable and undesirable. Both urban and rural participants suggested that it’s better “spend more on quality and community” (PEI 3) than “support mass production” (PEI 6), further highlighted in this quote:

“...you’re helping the people who run Walmart get richer and putting your hard-earned cash into something not worth it. If you buy a cup at Walmart for \$5 it’s just a \$5 plastic cup from Walmart. But if you buy a \$30 mug from that girl over there, you’ve helped her and now you have something special that you’ll take care of and won’t need 5 of them. Really, does everyone in your house need 5 cups? Or could you all have one special cup? When I was growing up I had a sweater that my nan knit me. Before I jumped in the mud, I took it off and set it aside. When it got a rip, my mom scolded me. What would you do if your kids shirt got a rip? Throw it out.” (OOKS 9)

Many of the following themes have ideas about alternative economic plans and ideas woven among them, especially the themes of anti-establishment, specialness, social sphere, and wicked tensions. 23.7% of Makers in Rural Ontario and PEI recognize the need for change but disagree on what that change needs to look like. However, they all support an increase in local production, the sharing economy, and a reduction in overall consumption. While this didn’t explicitly come out in the other half of my interviews, it was often part of how participants live. This is also consistent with the results from the Q-sorts; sharing, gifting, and bartering were consistently ranked within the top 5 more important values.

Only 14% commented on making as a part of a new economy. They suggested that making “doesn’t have a large impact on the economy” (PEI 6) but that this could change because the reorientation of the process of production “holds the power to really make a political statement. And the more people that get on board, the bigger the economic impact that we’ll have. I am only one person, but even I can see that our current economy isn’t work, so I know I can help change it” (City 10).

One participant commented that the economy is “in transition” (City 8) and that it often “shifts” and right now it is “doing a lot of shifting because the incoming generation is so different than the last one. Not just in our preferences, but in what is available to us as individuals”. One participant at the OOKS said that we’ll never have an economy that “fits into some idealistic wonderland description, but when I think about the future and what the economy might look like, I like this [the One of a Kind trade show].”

In PEI the participants were facing a different reality. Their economy has largely disintegrated already or been taken over by Irving (a petroleum company). 44.4% of PEI participants said they were already creating their own economy through bartering, trading and sharing with one another, and creating an economy within which “we take care of one another” (PEI 4). The PEI homesteaders said they didn’t want to “impact the economy” but rather find a way to function outside of it, on their own. This kind of sentiment is understandable, PEI 6 said that islanders have had to think independently already because “Irving has run the economy here for so long, and that’s just not sustainable. After a few more years we’ll really see things start to fall apart, but I think that’s okay because we’ve learned to take care of one another”. The participant was alluding to economic collapse in the region, not broader environmental collapse.

This kind of local/regional collapse in the market economy is one very clear route to the reembedding of subsystems acting in livelihood.

6.3.2. Community and the Meaning of Life

Making as a community activity is an outcome that I expected to see in nearly all participants, however only 31.1% comment on the explicit need for community in their craft. This number grows slightly to 49.5% when including participants who comment on the need for community in relation to mentorship, trading, bartering, selling, or simply socializing and friendship. 81.4% of the participants in PEI were members of the Crafter Guild which gets together as a community to socialize and to ensure that all crafters have what they need to be successful. Of this community, one participant said she “owed everything” to them, because they had supported her through difficult times and ensured she was taken care of while helping to get her back on her feet (PEI 11). 66.6% of PEI participants agreed that the community in PEI would certainly be there to catch one of their own if they fell into a state of need.

The One of a Kind Show participants were excited to be at the show, but only 12.8% commented on community. One mentioned that “this is like going back to camp” (OOAKS 2) because they have all been friends for a long time. Those at OOKS, using Etsy to sell (100%), are members of online community groups to discuss strategies, challenges, and problems. OOKS 1 said that the community helps individuals “stay responsible and ethical in their work” while also “helping everyone to be their best and succeed”. City 10 claimed that without their community, their craft wouldn’t exist because they are the inspiration for their work.

100% of preppers and homesteaders consider their family and those that live with them as integral to their well-being and success in the future. One homesteader said that their community

“is everyone here that I live with, and they will always come first before anyone else who lives off of this farm. This community provides me with sustenance and satisfaction, so I don’t need to go beyond them” (PEI 25). This veiled in/out group mentality was consistent among preppers and homesteaders.

When asked about the role of community in their craft, a participant in Maker group 1 stated that they “sometimes get annoyed with all the questions from the newbies”, two additional members of Maker group 1 agreed with this.

This idea that the community is good for learning was echoed by PEI 8, “as people are just beginning to tinker, then community is a great benefit, but it’s not necessary and sometimes a hinderance”. While most at the Makerspaces enjoyed being mentors, some people did not enjoy this:

“Making is something I do alone. I like to be alone and I don’t want to have someone else asking questions or constantly looking over my shoulder. I’m sure there are people who prefer to do it together, but honestly you just need your own two hands. If you want to make a community out of it, you’re not really looking to make, you’re looking to fill a void that society has created for you.” (PEI 9)

PEI 9 is correct in saying that some Makers may be looking to fill a social void. In an open question to those at a Makerspace, 58.3% of the attendees said that they were joining hobby groups to fill a social void in their life. When asked why those chose maker groups one said it is because “it is social while learning something” (Makers 2) and another said “it isn’t just important to meet new people but meeting those people should also make you feel happier. Being here makes me happier because I’m learning, socializing, being creative...” (Makers 2).

However, 6.7% of participants also discussed making as a solitary activity. City 10 said that crafting alone is how they relax. City 11 said that the solitary nature of crafting is the major draw to the hobby. City 12 specifically stated that “crafting isn’t about community. It’s about

anonymity, especially when you start. Then you might attend a class and use the community to learn, but then once you've mastered it, you retreat back in. I can't imagine there are many crafts that can actually do good work with a lot of people around them".

For 12.1% of participants, making is associated with religious and spiritual meaning, which can be both community oriented or focused on the individual. 2.4% of participants described making as a 'ritual' through which they derive meaning and feel unhappy if they do not participate in it once a day (City 7, PEI 12). The spirituality and ritual nature of making seems to develop over time. City 11 said that they "didn't have a sense of spirituality when I first started crafting, but I remember once when I was crafting with others and there was a man who was so silent the whole time. I asked his wife about it and she said that for him, it is an act of expressing gratitude to the world, so crafting is a very spiritual process to him. After that, I became more introspective about crafting and now, I see the world differently because of my craft."

In a similar vein, City 12 said, "Eventually, crafting is how you start to relate to the world, it's almost religious". Therefore, City 12 argued, community doesn't have to be important. Just as a Christian's belief in God is not integral upon the community, neither is the spiritual fulfillment of crafting bound to a making community. PEI 16 describes the relationship a maker has to the world as so intimate because all of a maker's senses are engaged with "the feel of a textile, the smell of clay, the brightly lit colours of wool, and your hands are the ones bringing them all together into something really beautiful. The necessary focus for doing that meaningfully is so deep, you become absorbed in your senses and the motion and you become just one part of it all".

One of the most common themes that emerged about hand & brain reintegration in relation to making is the experience of flow in making and “getting lost in the process of doing something” (OOAK 12). This leads to an “...end product is filled with that mindfulness and my peace of just being there and in the moment” (PEI 5). 16.5% of participants alluded to this feeling. City 6 said:

“When I start to code or make, I go into a Zen state, the world around me evaporates and I’m in my own universe. If I really get into it, I can work for hours upon hours without even noticing a moment of time go by.”

Later in our interview, City 6 painted a contrasting picture to this:

“Compare it against the number of people sitting at work watching the seconds tick by. People are so aware of time. They are aware of it passing by and being bored and counting the seconds until they can leave their job and go and do something like watch TV. Oh, so wait, yeah, when they go home and watch TV then the time goes by, but that’s different. That’s like being plugged into a passive drug. Making and coding is creative and makes your hand and body connect in a way that it usually never does.”

PEI 9 mentioned that she can see it in the work of her children, “it’s so nice to see my children making, they aren’t distracted or zoned out, their hands are producing something that is going on in their tiny minds and it’s beautiful”.

PEI 9 went on to say that this kind of thinking is hampered by school: “schools don’t allow kids to make mistakes and they make them work too hard with homework and requiring them to do a lot of extracurricular activities. There is no time for them to sit and just be creative. Then, when they go to university, the professors are confused as to why these kids need more and more hand-holding. They’ve never experienced an unscheduled life where they can think freely and creatively. Making allows children to do that.”

There were indications that making activities can be a significant contributor to self-esteem and feelings of self-worth due to these opportunities to be creative and enter a ‘flow’ state. City 3 suggested that the “way towards a meaningful life is to have something you’re

proud of at the end of the day. Making helps de-alienate people and bring that meaning back into their lives (Ollman 1977). If you can make something that you're proud of, and you did it to the best of your ability and someone else gets joy out of that, that is the very core of a meaningful life". Makers that are also mothers agreed with this, with one saying that the satisfaction from making "is right up there with parenting, because making, creating, and loving are what being human is all about. Quality of life is so important to us, so we need an economy that supports those things" (PEI 4).

Making specifically seems to increase the self-esteem of children. However, we did not do any sort of before and after testing to see if self-esteem actually does increase with making. This is an opportunity for future research which would require a longitudinal study. The children in the Metcalf study said that participating in the workshop did increase their feelings of confidence. City 5 said that once her daughter started participating in making "it really contributed to her confidence level". City 1 argued that getting a tool into the hands of a young person before they turn 12, has significantly increased their ability to think critically and be confident in their education and social settings. Children at the homes of preppers and homesteaders were also eager to show off their skills, and demonstrate, at least in their behaviour, high levels of self-esteem.

6.3.3. Social Change Over Time

The rise in fear about the future is pervasive in Western society, as explored in Chapter 1, so it was no surprise that it came up repeatedly while speaking with Makers. PEI participants are facing a particularly uncomfortable future where sea level rise threatens to put around 15% of the island under water and some areas, such as Lennox Island, will be upwards of 50% under water or eroded away. City 2 said that more "people are beginning to be cautious about buying a

coastal property. There is more of an awareness, of the impacts that we'll soon be facing". This is consistent with what four other PEI participants said. PEI 5, 6 and 13 all said that people, especially young people, in PEI are scared about the future because "the world is turning upside down, just in this week alone, Turkey throwing a coup, a truck hitting people in Nice. It's going to be a really crazy future" (PEI 5). However, there is a sense that living in PEI is a resilient option. PEI 21 said:

"In PEI we're removed from the dangers of the future. No one is going to come bomb PEI, we're safe. You feel secure here. We're an island and we have a strong community. Take out the bridge and no one is getting to us. That's not the primary reason we're here, but it's in the back of my mind. The world's a little bit crazy and I think you need to step away from that."

The homesteaders felt particularly safe because they grow their own food such as "a couple of pens of chickens, and we have pigs most of the time and we trade with the neighbours. Eggs and bacon for butter and bread. We have too many eggs" (PEI 24).

Those in Kitchener responded that making and learning new skills makes an individual more resilient in unknown futures. City 1 pointed out that Kitchener, as a whole, is quite resilient because it doesn't rely on one particular kind of corporation or industry, and "the maker world is all about creating that kind of diversity on micro scales, we create little pockets of resistance against change". Two other participants from the city, when asked about the future, said they were "glad I can fend for myself and know some great people in my hometown that will band together! I'm glad I can fix a car or a toaster so I won't be struggling to keep my life in order" (Maker 4) and the other said "we'll of course all need to reorient our lives, and you can't rely entirely on handmade goods, but if you give yourself enough knowledge and a network of other people with complimentary knowledge you can create a network and community of Makers that will have everything you need to survive" (Maker 2).

However, the way craft is evolving is less of a response to perceived future needs for survival and more on how craft is valued or viewed in society. Participants reflected on how craft has changed over time in three ways a) the history of undervaluing craft, b) oversaturation of craft today, and c) the role of disembedding and what is happening to counteract this.

Culture PEI (City 2) compared the undervaluing of craft to the classic undervaluing of women's work. PEI 4 echoed this sentiment stating that there was a "fork in the road" taken decades ago in relation to craft. She recounted that in medieval times, craft was controlled by guilds and to be a crafter wasn't just about making consumables, it was about making important things and there was status associated with being an artisan. Sometime in the 1950s or 60s, household craft and artisan crafting became merged together. It was at this point that things got "murky" because any housewife could become a "professional knitter and a highly skilled woodworker could participate in craft just as leisure" (City 2).

PEI 17 connected this to the work of Dewey and Montessori, who have long argued that craft adds meaning to life, that there is value in the process of doing craft, not just the end product. PEI 17 compared this with music and that there was an assault on the sacredness of crafting in the 1960s, just like music, because it got muddled up with macramé and simple handcraft things that anyone can just go and sell at a craft sale. Since then the "whole notion of craft has become very confusing and the idea that you're honoring people who have spent a lot of time and energy into honing their skills is completely gone" (PEI 13).

Montessori's arguments on craft underpin the Montessori approach to education. Out of those who had children (25%), 12.6% of the participants' children were out of school for too long to make meaningful comments about the role of education and crafting. In the Metcalf workshop with children, we didn't ask the children about the role of making in their formal

classroom. However, some participants did speak about education in relation to a) devaluing craft and art, b) how best to educate children, and c) questioning if children are learning everything they actually need to be learning.

Participants based out of PEI were the most critical of their education system. The entire province of PEI saw a cut in funding for the arts, so now the education program is lacking. There exists “a good drama program, but in terms of physicality and doing thing with their hands, it’s not there at all. There are professional programs like building trades, but nothing like fine wood working or boat building. Nothing with that level of skill” (PEI 6).

Now, crafters who do high quality work have to charge higher rates and the only people that can afford it are rich people (City 2), and schools like Montessori function as elite private schools. But, selling to “rich people is the opposite of what the crafter wants and of what we should hope to see in society. Luckily, the quaintness of crafting seems to be disappearing. People are craving something special and physical, not just virtual and disposable” (City 2).

Some of the participating Makers argue that what they do is important because their products are special. PEI 7 described this:

“Things made one at a time, a piece of the crafter’s soul is in each piece. That’s a subtle concept. This may have no soul at all, but something of equal size and usefulness may have a huge story attached. He cut down the tree, used hand tools. It has so much soul, but might be indistinguishable. Even this office, this building has a story and a lot of soul so it would be tragic to go somewhere else. And not everyone would be willing to say that right away. A lot of people might see art or a building and say it was nothing special. And then they meet the artist or have the skill to look at things in a certain way, then you see and feel the soul. You always look at something a different way when you hear the context.”

This quote brings to mind the book *Soulcraft*, in which author Plotkin reflects extensively on modern society. He said:

“The Western worldview says, in essence, that technological progress is the highest value and that we were born to consume... The most highly prized freedom is the right to shop...

Competition, taking, and hoarding are higher values than cooperation, sharing and gifting.... Western lifestyles that revolve around a constant barge of anemic distractions may be, in part, ways of self-numbing so as to minimize the pain of that loss... This way of life becomes an addiction. The more we live this way, the more alienated we become from something deeper and more meaningful, and the more we need this way of life to keep us from experiencing that alienation” (2003, 91).

The second area explored in relation to change in craft over time, is that there is now an oversaturation of craft and artisan work. 27.1% of participants lamented that there are is so much competition that your work either must be very unique or very competitively priced. And, because craft is now competing in a globalized economy, it is difficult to price competitively because it is so much cheaper to produce craft in other areas of the world. Also, countries such as China will produce knock-off crafts en masse, and sell them at highly discounted prices. Thus, those simply looking for the artisanal ‘look’ can get it very cheaply on Etsy. The consumer needs to be committed to supporting artisans, not just consuming the look. City 2 sees a trend developing in relation to this: “On the one hand, younger people are beginning to have an obsession with technique. They are like the old guilders – producing beautiful and finely crafted goods. On the other hand, young consumers are more ethically minded than ever, so they are more likely to seek out the producer of goods and support something they can feel good about, rather than looking for the lowest price.”

The third area is that of disembedding. The City 1 reflected on this:

“Etsy has disembedded people from a geographical context. Etsy, serves to remove the narrative from the object. It’s commodifying craft and making a global market place for crafters which is a weird and new phenomenon. ... There is mass production from China on it. And the challenge for an Etsy artisan is to reattach embedded narrative to their work. The stuff from China, no one wants to hear that story, so some people lie and create false narratives. But the story about a young crafter in Kitchener reusing materials from the Iron Horse? There is something special there.”

6.3.4. Wicked Tensions

Some participants were acutely aware of the tensions (see Chapter 4) that exist in their work. For example, City 11 very clearly stated that while they see themselves as self-sufficient, they still depend on the economy to feed and clothe themselves and their children. One of the homesteaders was also very aware that their strong community mentality had created strong out-group antagonism. City 2 pointed to this saying that:

“there is another side to community. When the tourists finally clear out, it’s like the people who are left are the family, the ones that really matter. When the tourists leave, it’s when people start saying hello to each other again on the street. Craft thrives on that community, but also relies on the tourists to buy the goods, but the crafters don’t like the tourists. So, there is a strong tension there”.

City 2 also commented on the point that people buying fewer quality items would mean less taxes for governments to take care of the society. They argued that “if PEI became filled with artisan crafters, then they may also have to take control over the road work, which would be difficult and weird”. However, they went on to suggest that the opposite could happen, “if people are buying from local artisans, rather than something from Staples or wherever. First, you’ll be paying a whole heck of a lot more, and all the money will go to someone who lives here. From a global perspective, it’s difficult, but from a local perspective the money can more directly get transferred and taxed locally, you’d have to really change the system”. There was a consistent complacency with ensuring one’s local community was taken care of, leaving the rest of the world largely out of the picture.

The PEI preppers and homesteaders also highlighted a tension in relation to violence. While most of them (77.7%) said they would never resort to violence, they were fully stocked with equipment to “protect myself and my family” (PEI 22). They also lacked confidence in the government’s ability to maintain control over violence if ‘anything were to happen’ and

therefore “need to ensure that we can fend off anyone looking to freeride on our forethought” (Rural 26).

Additionally, 18.5% of the women Makers in PEI recognized that they chose a very traditional role for themselves as stay-at-home mothers, which allowed them the time and freedom to make and create. Two of these women pointed to their daughters who are now artists, but have been artists since high school so it has hampered their ability to have children and start their careers. They suggested that being a traditional wife may increase a woman’s ability to be a creative artist or maker. On the other hand, a young woman at the OOKS said that it was the “independence allowed to women, and the empowerment of entrepreneurship that has led to me being really successful in this industry” (OOKS 12). This highlights the tension between women as empowered entrepreneurs and stay-at-home moms.

86% of the participants (excluding the Metcalf study) were women. There is a suggestion that women are not participating in economics, but this indicates that rather than studying economics at a university, they are practitioners of local economic development (Dynan and Rouse 1997; Kahn 1995). PEI 2, 3, 4, 11, 12, 17, 22, and 24 all said they became Makers because they wanted to be their own boss and to have a flexible job while being the primary caregiver of their children. These women continued to rely on their partner’s income to make the situation work. PEI 3 expressed frustration that her decision was looked down upon by other women she knew, that her work was “undervalued and not seen as progressive” in the eyes of her friends. However, PEI 4 said that choosing this route was one of the most empowering decisions she ever made, instead of adhering to what everyone else thought a modern woman should be, she chose a project that provided her with “freedom, independence, confidence, and creative expression”.

PEI 11 said that becoming a maker was integral to having a happy family. When she was an accountant she said, “I never saw my husband and my kids were being raised by someone else. I didn’t like that. I was deeply depressed, but I was doing it because I was told that I should be in the workforce. It took me a long time to see that that’s just not where I was happy. Now I have the opportunity to take care of my kids and put my family first, and that’s what’s really important to me. I believe that women can still be progressive, even if they are taking on traditional roles”. PEI 12 said it was an important decision because she couldn’t rely on the education system to give her children the education needed to express themselves. She went on to say, “I think there is a difference between letting women do whatever they want, and allowing women to be happy with whatever they want. No one woman should feel more successful than the other because she has decided to put her life force into something different than another. My sister is the CEO of a large company, she’s incredibly impressive. I am the mother of 4 wonderful children, I am equally as impressive. My neighbour is the neighbourhood community organizer, she is wonderfully impressive. We all have different roles to play”.

Two young women at OOKS said that being a woman maker was a form of empowerment. OOAK 1 said that as a maker “you want to make as much money as possible and be successful while being the CEO, CFO, creative director, and producer. It’s hard work and shouldn’t be undervalued in the way that it often is”. OOAK 4 said that being a maker is “helping to smash the patriarchy because I am showing my daughter that she can be artistic and love flowery beautiful things while learning the structural rules behind bridges and how to build things to make them ‘work’. Making isn’t just about arts and crafts, it’s about designing things for life. I want my daughter to feel free to be a stay-at-home mom or an engineer or whatever, as

long as she's doing what she loves. There is no use for feminism if it's going to lead to a bunch of young women killing themselves to be the best".

Two other women also pointed out that being a stay-at-home mom and having children hampered their ability to make. This suggests that more intergenerational care could be an important part of a new green modernity. PEI 12 said that after having a baby she "started to miss out on so much" in her music life and her crafting life because the baby started taking up too much time. This led "to a deep depression that I was only able to come out of after putting myself back into my creative arts". PEI 6 had a similar experience:

"I was a stay-at-home all alone in the north and then I stopped making and it was a big mistake. It all happened when I stopped creating, and I wasn't on the mend until I started making again. I tell all these young mom's – do not under any circumstances stop making. It was that poignant for me, and it wasn't resolved until my daughter was old enough to say, "I want to be a stay-at-home mom, like you!" and I said, "no fucking way". So, I bought some beads, and created a cohesive collection, and sold out at a craft show right away and then I was asked to do more, sell them higher, and create a formal production of it."

Women Makers are struggling with a lot of different issues. Rural Makers are trying to demonstrate that they are still progressive and empowered while urban and younger Makers are trying to use making as an expression of empowerment and independence. Q-method outcomes also demonstrate this struggle. While all the participants rank family as their most important value, the idea of 'freedom' was inconsistent. When asked about this, participants said that being with family can provide freedom, which made the actual notion of 'freedom' less important. Those that ranked freedom quite high, said that without freedom the rest of the highly valued things in life mean nothing. Freedom is either implicitly or explicitly important to the participants, and yet many recognize that their lifestyle limits the broad vision of what 'freedom' is.

Part 3: Connections and Discussion

The remainder of my thesis brings the theoretical context and research results together to answer the primary research questions. To reiterate, the primary research question of this PhD dissertation is:

How can prefigurative communities of practice better inform systemic ecological economic approaches for cultural change and problem solving to maintain a progressive and high quality of life while remaining within limits of the biosphere?

Thus far, my approach for answering this question has included a presentation of the weakness of ecological economic approaches in including the social sphere and a case study of an active alternative political economic approach that could function as a prefigurative politic. Using the outcomes presented in the results chapter (Chapter 6), and the literature review, I answer this question in the following two chapters:

- 1) **Chapter 7: Challenges and Opportunities Presented for Ecological Economics:** In this section I present a definition of and framework for a community-based vision for the future of ecological economic research. I present an overarching definition of what a healthy social sphere would require and discuss eight characteristics that function as broad indicators for a positive relationship between the social and biophysical sphere. I also present economic applications that could encourage development of these eight social characteristics. Given the argument put forward in Chapter 4 regarding the reality of unintended consequences to change, I also present challenges to these characteristics that emerged during the research process.

- 2) **Chapter 8: Final Discussion and Conclusions:** This section focuses on my theoretical and applicable contributions to the field of socio-ecological sustainability. I make some concluding comments, discuss limitations of the study, suggest future avenues for research, and present my contributions to the field.

7. Challenges and Opportunities Presented for Ecological

Economics

Thus far I have presented 1) a critique of ecological economics, 2) a theory of social system change, 3) a literature review relating to the historical sociological processes that engendered contemporary social systems and 4) themes arising from the case studies. Synthesising insights from these three literatures and the case studies, this chapter articulates a new, community-based approach to ecological economics. First presenting an overarching vision, I go on to explore eight defining characteristics or Ecological Economic Development Goals (EEDG), in each case drawing upon each of these four sections and supporting data.

In Table 8 I define each of these eight EEDGs, relating each one to relevant research themes, and stating the associated challenges and opportunities. The ‘challenges’ relate to potential nonlinear and/or unintended consequences that may be associated with the pursuit of an EEDG. The ‘opportunities’ are based on possible ecological economic applications that might facilitate the development of the EEDG in question. The opportunities column of this table is not exhaustive and requires more research. The idea is that the EEDGs would be used as benchmarks against which to explore how, and the extent to which, communities may already be meeting those goals; and the role of ecological economic tools and techniques in facilitating further progress.

Table 8: EEDGs, related research themes, challenges, and opportunities

<u>EEDG</u>	<u>Related Themes</u>	<u>Challenges</u>	<u>Opportunities</u>
<u>Equity and fairness</u> <i>Just distribution of goods, services, and financial resources</i>	Alternative economics (gift, share, barter, local currencies); self-esteem building; special role of women	Difficult to manage/govern; requires organized complexity; requires an extended empathic circle	Open source access; local currencies; imaginative finance structures; mandatory work/life balance – just distribution
<u>Strong mental health</u> <i>high self-esteem and life satisfaction</i>	Counter culture sentiments against overworking; making as hand- brain reintegration; making as a solitary activity; making as a religious-spiritual activity; the correlation between making and self-esteem	Tension between re-enchantment or ontological security and instrumental rationality; Decreased consumption and contraction of formal economy means fewer taxes and social services	Open-source/local currencies shown to improve self-esteem; citizen owned production; maker/family-based hero-projects; work/life balance such as 4-day work week and \$70k income cap
<u>Meaningful Domestics</u> <i>all community roles viewed equally</i>	Gender neutral Maker education; self-esteem building for all children; Re-balancing the formal and informal economies	Contracting state likely to reduce the availability of formal child-care; challenges much modern feminism in so far as predicated on access to the formal economy	Work/life balance – 4-day work week, home-life seen as equally valuable/empowering as work life; community parenting; re-emergence of extended family
<u>Systemic Education</u> <i>meets the needs of the community</i>	Changes in craft incorporated into education; role of education in hand/brain learning; increasing self-esteem of children	Need to limit fear around harm/risk; experiential education is expensive; requires continuity in place and greater intergenerational continuity	Embeddedness in place as a driver for what’s learned; open-source access to education; students taught how to produce goods; hands on-learning; greater role of mentors Re-emergence of family/community contexts for learning
<u>Redefined Success</u> <i>non-monetary views of success</i>	Alternative economy; working less in the formal economy; the ‘ritual’ and satisfaction of hand/brain making; making improves self-esteem	Difficult to convince and engage people unless alternative meaning frameworks is introduced simultaneously; barter/trade/gifting entails more limited access to more limited range of goods	Work/life balance including \$70k income cap; innovation for needs – efficient allocation; encourage barter, gift, and trade rather than monetary exchange
<u>Thoughtful Consumption</u> <i>purchase of special products, more local consumption</i>	Counter cultural sentiments against corporations; how craft has changed to produce meaningful objects; Products made with emotions (hand/brain); making as ritual and spiritual;	Contraction of formal economy will reduce tax transfers and engender fiscal crisis; breakdown of international trade relationships	Citizen-owned production creating special and/or more durable, higher quality and certainly more expensive products; embeddedness in place; needs-based innovation; hold repair cafes & artisan shows
<u>Connection to place</u> <i>More meaningful relationship to land; re-embedding of individuals, communities and ecological places.</i>	Making as a reconnection with body and place; making as religious/spiritual activity; making with local goods reconnects; culture associated with local raw materials	Limits social and spatial freedom and mobility	Embeddedness in place through cultural ecological restoration practices; work/life balance as a driver to ‘local tourism’
<u>Profound Community Orientation</u> <i>all transactions in the economy meet the needs of the community</i>	Counter cultural sentiments against big government; making as a community activity; making as religious; making as resilience building	Likelihood of increased out-group antagonism	Citizen owned production as a way to learn/interact; work/life balance; open-source as a method of trust building; embeddedness in place; limit social media

The EEDGs are certainly normative, but throughout the chapter I justify the inclusion of each goal. The purpose is not conclusively to claim that the achievement of these eight goals would lead to sustainable relationships between the biosphere, society, and economy. Rather the case is made that, together, these eight EEDGs represent a new way to approach community-based problem solving and as a frame for imagining an ecological-economic trajectory for development. Using this framework, any future ecological economic tool or technique should contribute to at least one EEDG and, as far as possible, not detract from the integrity of the others.

Many of the problems explored throughout this chapter, such as alienation, narcissism, ontological security – are a direct, and potentially unavoidable, cost of capitalist modernization and the process of individualization (Durkheim 1893; Weber 1921; Giddens 1990; Ollman 1977; Twenge 2017). They can't necessarily be 'solved'. At best, society can make choices about balance of 'goods and bads'. The disembedding of traditional economy and society (Polanyi; Quilley 2012 in JSE) was traumatic and violent. In early Modern England, the 'free-wage labour' and modern citizens alike were created by the enclosure of the commons and the expropriation of the peasants. But this very doubled-edged process of 'emancipation' also engendered a process of individualization- without which it is hard to imagine positive phenomena such as extended empathy (Rifkin 2009), scientific reasoning, multiculturalism, increased rights for many (Pinker 2012) and the modern idea of the sovereign individuals necessary for democracy and rights based politics (Elias 2010).

Throughout the chapter I also include possible unwanted outcomes if the EEDGs are adopted seriously. These challenges are based on the literature presented in Chapter 4. Making is typically domestic and/or informal – and, as such, less visible to the fiscal system (although not

invisible because Makers still need materials and space). Any significant contraction in scale of the formal economy in this way would, potentially, divert revenue from the state undermining its capacity to deliver services and infrastructure. Any such ‘withering away’ of the state would almost certainly threaten cherished features of modern societies that expanded as a function of capitalistic economic growth. This includes anything from health systems and transport infrastructure, to childcare, schools, and police forces. I have organized these into five themes, outlined in Table 9.

Table 9: Cherished modern norms and the social processes that uphold them

Norm	Definition	Developmental requirement	Modern Requirement
Internal peace and security	State’s monopoly of violence; A general assumption of safety and state control of violence.	Effective nation-state (Elias); Imagined community (Anderson)	Police institutions; state funding; tax systems
Capital growth	Large trading partners and the right to accumulate wealth.	Individualization (Beck)	Capitalism; high energy throughput; extended empathy
Social progress and rights	Increasing respect for marginalized groups.	Citizenship (membership based/exclusive) And/in tension with human-rights (Loyal and Quilley 2018)	Gender emancipation; state child support; tax systems; birth control; secularization
Cosmopolitanism	Everyone is a member of a shared community with shared morality. Rise in literacy, mobility and mass media.	Literacy, mobility, mass media (Giddens; Gellner)	Cities; disembedding; individualization; educational institutions; bureaucracy
Science and rationality	Intensifying application of rationality, knowledge, and technological development	Effective states/markets Detribalization (Weiner; Gellner) Integrated system of nation-states (Giddens)	Rationalization; secularization; educational institutions; bureaucracy; time/space abstraction; disembedding

The overall purpose of this chapter is to synthesize the data and literature presented throughout this dissertation to ultimately present an imaginative future for ecological economics with grounded social and economic specifics. I use the basic resilience question from Walker and

Salt to guide my exploration: “What are the important qualities of a system that need to be maintained or enhanced for a system to be sustainable” (2006, p. 8)? I am also guided by their call to embrace change:

“At the heart of resilience thinking is a very simple notion – things change – and to ignore or resist this change is to increase our vulnerability and forego emerging opportunities. In doing so, we limit our options”

(2006, p. 9).

7.1. A Framework for Embedded Socio-Economic Relationships

I begin by defining what a healthy environment is. Based on this definition, I then discuss the kinds of social parameters that support such biosphere integrity. These social parameters make up the EEDGs. The social parameters in this section are derived from the case study, literature review, and historical sociology. Based on these EEDGs, I provide a series of economic activities that can potentially support a healthy relationship between all three spheres. The economic applications come from the case study, historical sociology, and approaches already used in ecological economics. While Daly and Farley are primarily concerned about scale, this discussion takes a Polanyian approach, arguably Daly’s initial intention (1989 pg. 7 – 12), by focusing on the relationship between the social and economic spheres.

To help navigate this discussion, I have created three snapshots of the relationship between the three spheres that make up ecological economic theory (Figure 2). In Figure 15 I show the different approaches whereby ecological economics could support the EEDGs. In this Figure ‘approach’ refers to the specific economic or political application being used in a community; and ‘potentially encourages’ refers to some of the possible outcomes of those applications for the community. The system map, in Figure 16, illustrates connections between the social and economic applications demonstrating linkages and feedback loops across themes. In Figure 17 I have summarized the EEDGs and applications.

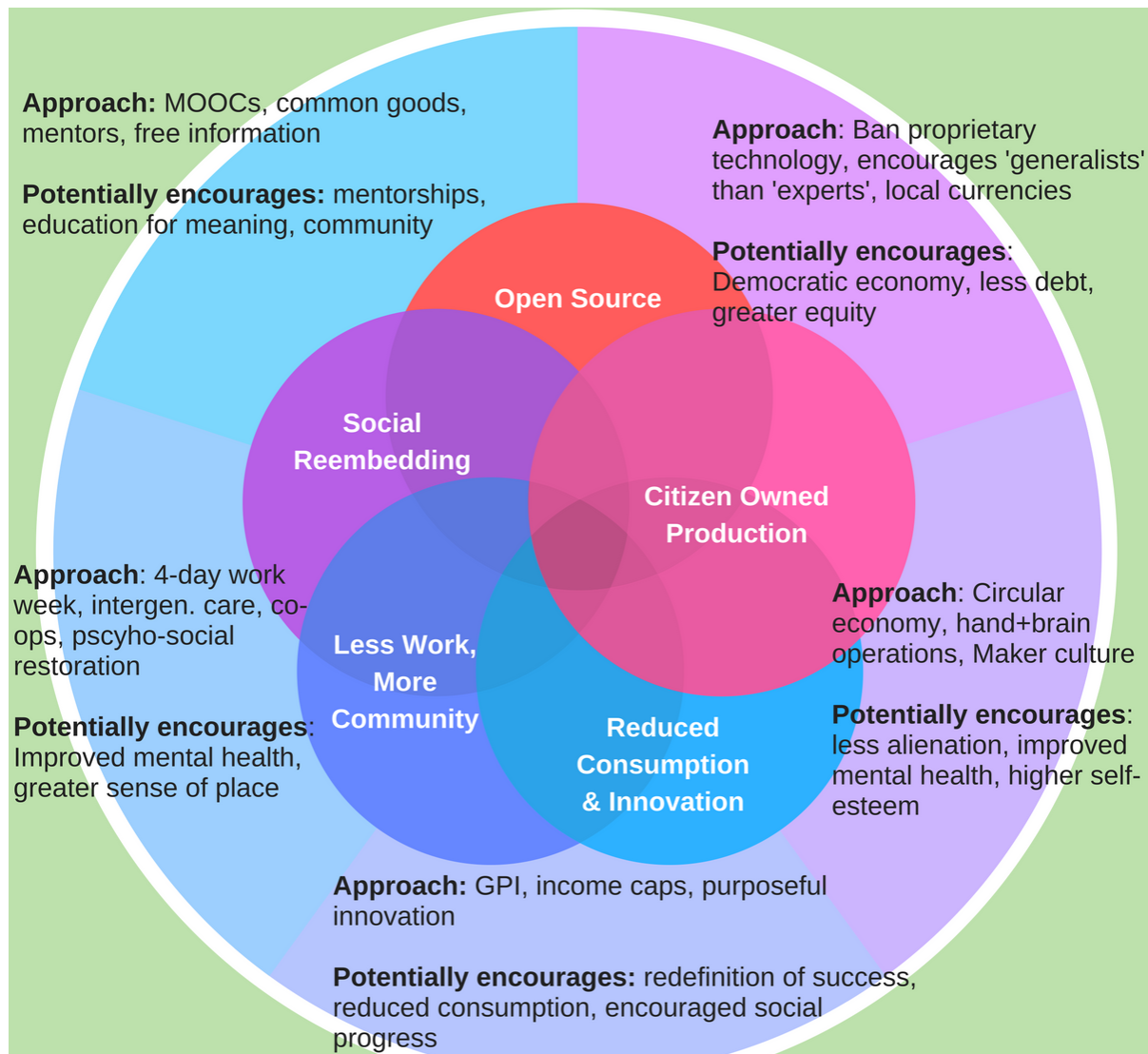


Figure 15: New approaches to action within the social sphere and potential outcomes of these approaches – each is discussed throughout this chapter

The outcomes and relationships between factors could vary widely depending on the context, so I reiterate that these EEDGs are not a prescriptive approach to ecological economics but represent a set of development goals that may be more realistic for finding the ‘sweet spot’ between development and biosphere integrity. These are not meant to function as a measurement tool for a society or to be employed as a tactic for any one specifically desired outcome. Rather

the parameters are designed to be used in concert to provide ecological economists with socially-driven components for problem solving and for understanding the specific contexts of local ecological economic development. Carbon taxing, ecosystem service analysis, and the four-day work week are currently understood as possible methods for improving the ecological economic relationship in a community; these intervention strategies can be used to understand methods for improving the socio-ecological relationships in a community.

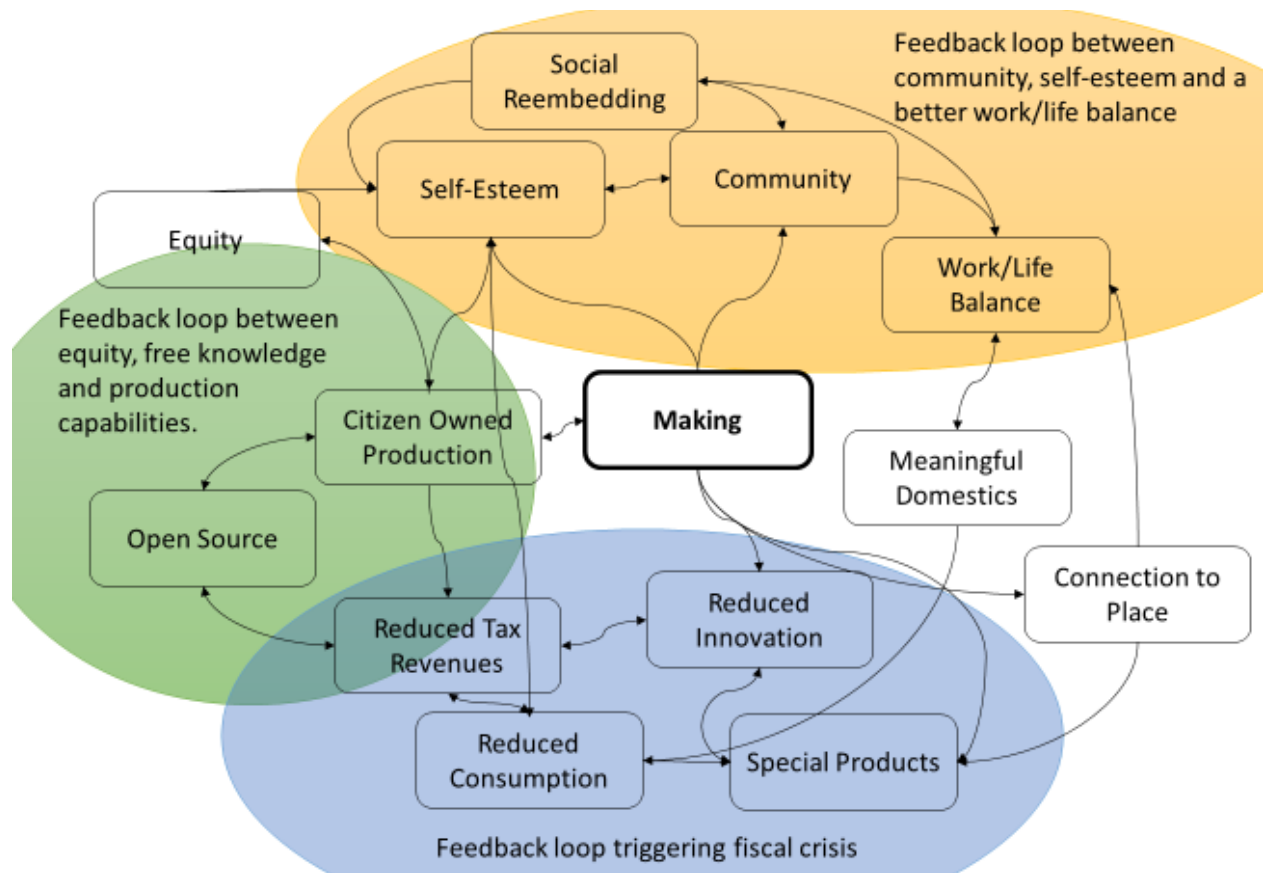


Figure 16: A flow diagram showing some of the relationships between various themes discussed



Figure 17: Main components of each subsystem

At the bottom of the Figure 17 there are four characteristics of a ‘healthy environment’. Several scholars have already identified various factors that should be included when setting social and economic limits on the biosphere. Prerequisites for a healthy environment would include: lowest possible throughputs of energy from production (Dincer and Rosen 2001, 2012;

Odum and Odum 2006; Sunita, Khanna, and Kaur 2013); greater reuse and cycling of materials; systemic reduction in resource extraction (“Waste - Environment - European Commission” n.d.; Ghisellini, Cialani, and Ulgiati 2016; Radhakrishnan 2016); maintenance of the highest possible levels of biodiversity (Myers et al. 2000; Tilman, Wedin, and Knops 1996; Wilson 1988; Worm et al. 2006); and maintaining the integrity of planetary boundaries (Rockstrom et al. 2009).

There are several biophysical and economic indicators that can point to a healthy or unhealthy environment within each of these broad areas. These may include air (levels of pollutants), fish, groundwater, land use, soil, water quality, wetlands, and deforestation.

Defining a healthy society is more subjective than defining a healthy environment. Indicators of environmental health are easily measured (air quality, for example) while parameters for a healthy society are difficult to measure. For example, ‘depression’ is a much more complex indicator to measure than air quality, but also the nature of social progress makes it very difficult to pinpoint what might improve a certain social health issue – the parameters vary between ‘health’ and ‘pathology’. For example, one might consider it an improvement in social well-being that people are seen as individuals and this means there is greater care for the life of that one person. However, individualization is also related to the condition of rising levels of depression and narcissism (Twenge 2017). These wicked relationships make the notion of social ‘health’ very difficult to define. This is further complicated by considering cultural differences in personality structures. What one society sees as socially healthy might be totally different from another. This makes it especially important to consider the context, needs, and desires of a community in relation to each EEDG. Using lessons from historical sociology and results from the case studies, I have extrapolated the EEDGs for use in investigations of ecological economic approaches to politics, life, and livelihood.

Not all EEDGs will be relevant for every context and the outcomes of the method may be radically different than that proposed in Figure 11 (given nonlinearity in complex systems). For example, a community with a mental health crisis might benefit from encouraging intergenerational care – but not necessarily (Zywert and Quilley 2017). And even if such a strategy was potentially useful, the community might not have enough family units to make such a system viable. For these parameters to be useful, the context of the situation needs to be taken into consideration, but in general these EEDGs should be good places to start. If the field of ecological economics is to progress, methods for social change need to be regularly added to the discussion, even though they are complex, messy, subjective, context dependent and potentially vary depending on the cultural structure of the perceiver over time. The inclusion of intergenerational care is cheaper for the state while curtailing freedom for individuals, but also a possible source of long term source of greater meaning structures; there are almost always going to be trade-offs in these ‘solutions’; the idea is to identify structures that might engender different relational balances between one another (greater community and a stronger shift to the ‘we’ from the ‘I’) and with the biosphere (reducing consumption and creating an ecological identity).

After reviewing the data, creating the flow chart with the data, and charting out the outcomes of the study and literature review, I focused in on eight EEDGs that challenge patterns of social change that have led to negative environmental impacts. These parameters are clearly labeled in the ‘society’ section of Figure 17.

7.1.1. Equity

Equity refers to the just and fair distribution of goods, services, and finances. This does not necessarily mean that the distribution is equal. A common example of an equitable distribution is

giving the tallest chair to the shortest person to see over a wall, and the shortest chair to the taller person. The taller person is getting less chair to see over the wall, but the shorter individual needed more to have the same outcome as the taller individual. It is already an existing part of the ecological economic framework.

Sustainable development agendas have long recognized the need for strategically planned initiatives that ensure wellbeing for all within environmental limits. This theme relates to the issues I have brought up about women. If society is going to go through a transition, it is potentially important that there are prefigurative political groups which ensure equitable degrowth strategies for all genders, countries, and races, if this is possible. Hard as this may be, redefining roles in society, such as the feminism I describe in section 7.1.3, can help us meet this goal. The threat of social and environmental crises is exacerbated by the extreme role of national and military competitions, in a world of diminished resources, it would be very difficult to get nations to unilaterally move in another direction. The only possible way to avoid such crises would be to develop alternative political structures for communities to move into, one such possibility is a degrowth plan for economies in the industrialized world – in this way, this whole chapter is about exploring possibilities for equitable degrowth by defining certain social characteristics to keep in mind as we develop economic applications and policy.

As a small side note, there seems at least to be growing recognition in the ecological economic community that there is a tension between the ‘equity’ and ‘sustainability’ pillars of ecological economics. This is an observation from attending a retreat with students in the Economics for the Anthropocene project at McGill University in January 2018. On the one hand, there were students insisting that justice and equity be seen as the primary starting point for all

economic initiatives. On the other hand, there were students recognizing the entropic cost of democracy (as explored in section 4.3), social justice, and rights.

As an EEDG, equity includes the serious inclusion of alternative economies and open-source access to knowledge, as seen in the maker communities and some existing areas of research in ecological economics including: imaginative finance structures (such as public money); mandatory work/life balance through income capping and; shorter work weeks to discourage competitive behaviour. In this section I focus significantly on open-source – while participants did not talk specifically about the role of open-source in their work very often (only 7.7% of non-Metcalf participants mentioned the importance of open-source in their work), I observed 88.8% of rural participants and 72.7% of urban and Makerspace participants (excluding the OOKS because I didn't actually see their work in production) utilizing open-source software or online systems.

The Open-Source Movement “harnesses the power of distributed peer review and transparency of process. The promise of open-source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in”(Open-source Initiative 2014). Related, the ‘commons’ refers to a common-pool of resources available to everyone at no cost, belonging to no single person (air, water) (Feeny et al. 1990; Hardin 1968; Laerhoven and Ostrom 2007; Ostrom et al. 1999). An example used to demonstrate what ‘open-source’ functionally amounts to is a person’s operating system. Linux, Windows and Macintosh are the three largest operating platforms. Linux is completely open-source – users are able to access the kernel of the internal operating system to change how anything about the computer functions. Windows, while not open-source, offers some customization and access to the internal workings of the system. A key difference between Linux versus Windows and Macintosh is that Windows

and Macintosh do not make public the code for the operating systems. Macintosh is more closed than Windows – it is a completely proprietary and closed-source. Most consumer or technological items in the average Canadian home will be proprietary and closed-source – this is a common and pervasive business model for companies that allows them to profit more than once on the sale of a single consumer good (Steele and Bloom 2012). For example, when a part breaks off something, a company wants to ensure you go to them to replace it, so they make very specific pieces. This is why the iPhone charger was different than the Android charger and why Apple occasionally changes their charger – not often enough to lose customers, but often enough that it increases profit.

The argument put forth by open-source scholars is that open-source approaches to knowledge and economies are better because everyone should at least have the option to modify or interact with something that they own (Gupta 2010; Moglen 2003; Steele and Bloom 2012). Open-source initiatives increases equity in three ways, namely (i) they are associated with decentralisation, (ii) they foster community ownership and, (iii) they draw attention to the possibility of a ‘distributed’, equity-based form of political economy (Jakubowski 2016).

Decentralisation is the process of redistributing power or things from a central authority to a greater number of people. The most concrete example of this in the commons (so far) is in monetary and intellectual exchanges. Software, ideas, and development are often all free or sold by individuals rather than large companies. This relates to the issues explore above because it removes complexity that has been imposed by highly organized bureaucracy. With decentralisation, accountability comes from everyone in the community. Every person in the system is accountable to others and every person is a source of information for all other people (*Keynote: Eben Moglen 2015*) which in turn creates strong community bonds. Moglen argues

that if the network can stay large enough there could be potential for extension of empathy through the need for trust and connection between persons to keep the system honest. This is interesting because Rifkin and Pinker suggest that the expansion of one's empathic circle is linked inextricably to our growth paradigm⁴ – if it could instead be linked to a commons paradigm, that could potentially be beneficial for countering out-group antagonism in some instances. However, outgroup antagonism has historically been curbed by national security and a the state monopoly on violence (Weber 1921), patterns of mutual identification (Elias 2014), and imagined communities (Anderson 1991). So, at the same time any open-source distributed economy of small scale communities that undermine these features of the nation state might be associated with greater interpersonal violence and in/out-group antagonism.

The commons empowers knowledge transfer, founded on transparency and trust, that sustains community commitments to the network (Steele and Bloom 2012, 20). Steele argues that through sharing, more productive networks of knowledge emerge that are open to social learning. The high number of users contributing makes for quick iterative processes of ideas (Diamandis and Kotler 2012) to test innovative approaches. These systems greatly rely on a level of trust and a communal buy-in to the system.

Some open-source groups argue for basic income (Schneider 2003), communal ownership of knowledge and goods (Moglen 2003), and communal governance (Gupta 2010) all through technological collectives (Steele and Bloom 2012). All of these are communal systems, requiring community trust and collaboration.

⁴ Both Rifkin and Pinker argue that as we have become more 'civilized' (a reference to Elias' Civilizing Process) or progressed more as a global society we have becoming less violent (Pinker) and more empathic (Rifkin).

The commons also provide opportunities for new informal economic transfers built on cryptocurrencies, crowd-sourcing and transition from mega rich oligopolies to a larger number of smaller gains for a greater number of people (i.e. Etsy). In doing so, the commons help to directly disrupt capitalist business models and provide opportunities for individuals to participate in a new economy. Interfaces (software) and objects (hardware) become modular (as seen in Open-source Ecology) so that anyone can access, change, modify, and use anything (as seen in Wikis).

Moglen argues that right now, something new is happening online that offers a new political potential for a post-collapse world (2015). He argues that the “great riddle of romantic socialism” is being reborn through groups embracing open-source. Moglen goes on to say that it is the open-source community that will provide a new political-economy upon which prefigurative groups, such as Occupy, can use as their next step toward an equitable social reorganization, all through online networks.

This vision of an open-source, distributed economy has two major pitfalls. First, the system that open-source activists seek to create inherently relies on technology and expert knowledge. But the assumption that online Wikis, a global network of high grade servers and personal communication devices will continue to exist in the context of any significant process of degrowth seems highly optimistic at best and takes little account of any long-view of the future. Although there is some potential for low-energy local networks (Gupta, 2010) to run off renewable, physically linked, and local energy systems, it is not clear that such localism can be reconciled with the continuing production of hardware.

The second critique is that the commons also relies on a certain level of ‘expert’ knowledge to handle inner workings of computer systems. Most people are familiar with how to

use a computer, but not how to *operate* a computer using the internal ‘terminals’ or command prompts. A great deal more research is required to fully expose the opportunities between the commons and future socio-ecological discourse.

These two critiques point to the most obvious disruption that Maker Culture has to modern society is that of global trade and capital growth. The current mainstream economic system is predicated on growth and global connections. Low-energy craftsmanship and artisanal goods are likely insufficient for satisfying the needs (scale and efficiency) of large-scale trade. Ruskin (1854) argued that efficient economic progression and production can only be obtained at the cost of removing creative ownership, autonomy and expression within the process of production (alienating the individual) a process that continues today (Carrier 1992; Grey 1975; Kon 1967; Pappenheim 1959). There is a tension between the trajectory of science and innovation and economies of scale needed to sustain modern technology such as antibiotics and the internet and the ideal political economy of localism; a tension between disembedded global market economies and embedded livelihood economies. The idea is to reduce the size of the former with as few disastrous outcomes as possible and increase the size, scope, and diversity of the latter. The unknown question is what kind of balance is possible between these two.

More research is needed on the specific ways that making, the informal economy of gifting, and the associated sharing economy (Botsman and Rogers 2010; Hamari, Sjöklint, and Ukkonen 2016) impact the formal economy. However, given the common theme of ‘specialness’ of goods and the potential ability for making to overwrite addiction to consumption, it could have a large, potentially disastrous, impact.

Some versions of Maker Culture are predicated firmly on capital growth. Making can both function as a part of an informal economy and be co-opted by capitalism i.e. Maker Culture

is compatible with both growth and degrowth economics. It depends on who, and in what context, is participating in making. In the case of the isolated and community-oriented maker groups in my study, it was effective at supporting an informal and new ‘commons’ economy, similar to that described earlier by Rifkin. Those conducting their craft in maker spaces and utilizing Etsy as a primary means for selling their goods are directly relying on outcomes of capitalist economics and infrastructure, or at least the internet. Maker spaces are supported by the state or income generated in jobs outside of the space and furnished by machinery bought via the mainstream economy.

The fact that many of the raw materials are also sourced from mainstream hardware stores, perhaps also represents a problem for Makers – at least those concerned with self-sufficiency. Very few Makers were using raw materials that they had sourced themselves, except for those in PEI. In a playful thought experiment involving a scenario of complete system collapse, Lewis Dartnell suggests that this could be circumvented through scavenging of existing goods (2014). Given the collapse of larger systems that Makers depend on, the Makerspace could still be utilized for something like Open-source Ecology (open-access plans for industrial farm equipment that can be built for a fraction of the cost of commercial production), as it would be outfitted with the necessary tools and some materials. There is some general knowledge on machine repair and a significant interest in repurposing old/broken goods and recycling. A forward thinking move for those maker spaces concerned with a more overtly prefigurative politics of degrowth, would be to create a relationship with other specialized industries (farms, textiles) to facilitate networks of trade. Except, most Makerspaces, including the ones in my study, are not ‘political’ nor visionary or countercultural. This would be more characteristic of the Makers from PEI, further pointing to the importance of a broader redefinition of economy

and social life as necessary for change. Those relying on Etsy and ordering their pieces online would surely be unsustainable in a degrowth economy.

Despite these drawbacks, Rifkin argues that “the capitalist era is passing...a new economic paradigm – the Collaborative Commons – is rising” (2014, p. 1). He goes on to argue that we are already in the midst of a hybrid economy comprised of capitalism and the commons and doubts that capitalism will be the dominant economic paradigm by the second half of the twenty-first century. Ecological economists should be tapping into this as a pathway towards more equitable and embedded ‘livelihood’ societies.

7.1.2. Mental Health

The mental health EEDG refers to the mental well-being of individuals in a society. In my research this EEDG was supported by the role of alternative economies and Making in improving self-esteem, citizen owned production, and work-life balance. Participants discussed these elements in relation to the theme of overworking as a problem, and specifically linked Making to mental well-being in two ways. First, Making reintegrates the hand and brain leading to the feeling of ‘flow’ which relaxes participants and makes them “lose time” and sometimes elicits ritualistic and religious feelings. PEI 17 said “I go to my studio and hours go by. I mean, I can go in there at 8 in the morning and before you know it, it’s 4pm. I didn’t feel the time pass but I’m tired, happy, and satisfied.” In relation to this feeling, PEI 5 said that it often happens when the task is repetitive and while “some people might see it as monotonous, that’s what gives it meaning sometimes. I get into a trance-like state and the end product is filled with that mindfulness and my peace of just being there and in the moment”. Second, chiming with perceptions of my own respondents and various other studies (Riley, Corkhill, and Morris 2013; Taylor, Hurley, and Connolly 2016; Kouhia 2015), Making has been shown to improve self-

esteem, confidence, and to provoke feelings of pride in one's self. In this section, I explore what 'well-being' is, how it has been, at least in some ways, undermined by processes of modernity, and some possible EE responses to this problem.

Well-being is divided into "two elements – hedonic well-being, which refers to more transient feelings, such as life satisfaction and happiness; and eudaemonic well-being, which focuses on functioning, capabilities, meaning and purposes" (G. Henderson 2012). When these two areas coincide then mental health can be described as thriving. Currently, modern society suffers from a crisis of mental health including: low general life satisfaction; high stress in relation to work that detracts from primary social relationships; extreme levels of narcissism perpetuated by addictions to media; and relatively low self-esteem (Rogers and Pilgrim 2014; Schumaker 2001; Twenge and Foster 2008; Waugaman 2011; Lasch 1991).

These trends are characteristic of a post-industrialized society: "the way in which we live nowadays is not conducive to our emotional, social, and psychological well-being...well-being is a collateral casualty of modernity, with a corresponding trend towards placing insufficient value on meaning, purpose, or community with individuals increasingly seen as being separate, unique and alone" (G. Henderson 2012, p. 12), which echoes Laing's *The Divided Self* (1965). Just as the process of individualization is linked to urbanization, so too the latter undermines mental health "through the influence of increased stressors and factors such as overcrowded and polluted environments, high levels of violence, and reduced social support" (Srivastava 2009, p. 75-76). As individualism is seen as increasingly more important than a collective and psychological needs are instead met by consumerism there is a growing "sense of disconnection...and a weakened belief in the broader social ideal and commitment to common social and community goods" (G. Henderson 2012 p. 12). Despite the rise in GDP over the last

50 years, there is no corresponding rise in a sense of well-being, quality of life, or mental health (van den Bergh 2017; G. Henderson 2012), but rise in diseases of affluence such as depression, high blood pressure, and type 2 diabetes (Ezzati et al. 2005; Graaf, Wann, and Naylor 2002; Luthar 2003; Singh and Singh 2008).

Children are not exempt from this crisis. Constant parental pressure to succeed and constant stimulation via technology stunt critical development of the child's self, and leads to depressed, disconnected and anxious kids as young as three years old (Levine 2008). Preschoolers who spend greater time outdoors, off of screens, and lead more active lives are shown to be happier, more empathetic, score higher on standardized tests, and have greater self-control (Hinkley et al. 2017).

Jean Twenge's most recent research finds that modern teenagers (born in the mid-1990s to mid-2000s), are incredibly technology-capable and constantly linked to a technological device during waking hours (2017). These teens suffer from high rates of depression. 65% of girls aged 13-18 have experienced suicide-related events such as thinking about suicide, self-harm, or clinical depression. The percentage of teen girls with suicide-related events increased by 58% in 2012, the same year smartphones became widely popular in Western high schools. Twenge has a specific concern for young girls because girls tend to spend their time on social media while boys are generally more interested in games, which have less of an impact on mental well-being. Teens using social media have demonstrated short-term bursts of self-esteem, improved development of their sense of identity, and a broader circle of peer engagement, however this is accompanied by an increase in the prevalence of cyberbullying, depression, and in-person social anxiety (Uhls, Ellison, and Subrahmanyam 2017). While helping to develop a teen's sense of identity seems like a positive outcome, the focus on 'identity' takes for granted the pre-eminent

ontological and psychological status of the individual in relation to mutual identification with a group (Elias's 'I/We balance') – the trends of hyper-individualization is directly related to this problem (Beck 1992: Ch5).

A large contributing factor to the decline of mental health in Western society is this excessive differentiation of the individual and the self-perception of separation, autonomy and independence (Donnellan, Trzesniewski, and Robins 2009; Twenge 2010; Waugaman 2011; Twenge and Foster 2008). Twenge and Foster argue that this obsession is not an organic human development, that it has been engineered by advertising companies, social media, and consumer society, which creates a feedback loop. More realistically it should be understood as a function of modernity i.e. complexity and the extension of the social division of labour; the process of disembedding; the loss of connection with place-bound communities; and individual relations to market and state (Beck 1992; Elias 2007). Nonetheless this perception of the self as sovereign and self-determining is sold to modern individuals through advertisements and reinforced through the labour market and through mechanisms of social and private insurance. It also chimes with the overarching narratives of liberal democracy and the law, both of which depend on the rights and obligations but also capacities of individual citizens. Increasingly these modern selves share their curated lives on social media to get compliments and gain self-esteem through the approval of others ('likes'). At this point, the consumers are providing free advertising and perpetuating the cycle. This is fast becoming the primary way of achieving self-esteem, and it is of course directly related to consumption. If ecological economists want to limit consumption, self-esteem and mental health needs to be bolstered in different ways.

It is conceivable that mental health issues in modern Western individuals could be improved by utilizing well known tools and techniques from ecological economics such as

enforcing a four-day work week or six-hour work day, creating hard income caps so that the desire to work overtime is abolished, and banning advertising. A larger percentage of the solution must come about by undermining the role of consumer culture in bolstering self-esteem (Arndt et al. 2004; E. Becker 1973; Greenberg, Pyszczynski, and Solomon 1986). Referencing back to Terror Management Theory (TMT, in section 3.3), cultural systems function as ‘immortality ideologies’ which act as buffers against existential anxiety (Greenberg, Pyszczynski, and Solomon 1986). TMT suggests that humans possess the same biological imperative to survive as any other organism, but additionally possess mental capacity to dwell upon their inevitable death and mortality in general. This combination of an instinctual will to survive coupled with knowledge of mortality can become a source of deep anxiety. We need to believe that we live meaningful lives in a meaningful world. To cope with this existential dread, humans create meaning systems which allows us to believe that we are special. These are deemed ‘hero projects’, practices that increase feelings of belonging and self-worth, and can provide avenues for identity to live on after death (i.e.: the afterlife, children, a large pyramid). TMT has been used to connect consumption to this process of bolstering self-esteem, making it difficult to undermine consumer culture (Dickinson 2009) especially given its high visibility and the ease at which individuals can participate in it. So, if the real problem is the absence of a larger ‘project’ to be a part of, or a lack of ontological security (Giddens 1990), then ecological economic decision making must find activities and cultures, such as Maker Culture, to encourage through the community.

Ecological Economics should seek to offer meaningful alternatives to consumption. In his essay *Ethics for Economics in the Anthropocene*, Peter Brown outlines an ethic that he says is

‘critically needed’ for the future of humanity (2012). He argues that this ethic be grounded on three premises about humanity’s place and role in relation to Earth:

1. as members, not masters of, life’s commonwealth
2. as custodians of Earth’s household, and
3. as those entrusted with duties to preserve and enhance the low entropy sources on which a flourishing Earth depends (Brown 2012 p 2).

Similarly, Spash (2012) puts forward a large set of ethical and ideological statements that ecological economists ‘should live by’. There is a clear problem with simply defining ethical platforms – it is incredibly difficult to convince people to get on board to the extent that it would alter their day-to-day behaviour. It also does not necessarily follow that the pattern of life that is good for the environment will come because people are following green precepts or ethics; this emphasizes a logical shift for change, rather than one steeped in meaning.

In the book *Getting to Maybe*, there is an anecdote about a man living in a poor neighborhood with a lot of crime among the youth (Westley, Zimmerman, and Patton 2007). The man living in the poor neighborhood started a bicycle repair workshop for youth in the area, and there was a dramatic decline in the problem because the youth were given something meaningful to partake in and a place to come together that has purpose.

What Brown and Spash are suggesting is the equivalent of handing the youth a list of values and/or rules by which they should live. Even if some of them did think they were noble and worthwhile, it would never take hold because the process of defining what the systems ‘should be’ doesn’t necessarily influence the system.

As noted in the counter-cultural and self-esteem sections of my previous chapter, investing in Maker workshops, repair cafes, tool libraries, and task trading services potentially improves the self-esteem of people that attend. 91% of respondents in the Metcalf study noted that making provides them with a sense of accomplishment. Unprovoked, 70.7% of PEI participants said they moved to PEI or participated in craft to have a better quality of life. One specifically said she gave “up income for quality of life” (PEI 3) and another phrased it as getting “paid in quality of life” (PEI 8).

Maker events are attended widely by people who may not consider themselves Makers; they have mass appeal. Maker Culture is not the only way to bolster self-esteem that could appeal to a wide audience. Other cultural activities such as music, theater, brewing/wine making, religion, or simply more meaningful work could also improve mental health in a similar way as Maker Culture. These are areas of research being investigated in more depth by peers in my research group (Barb Davy, Katharine Zywert, and Anna Beresford). The appeal of Maker Culture is not only the improvement of mental health, specifically self-esteem, but also its support of local economies by encouraging sharing, trading, and local buying while disrupting supply chains – which also bolsters the self-esteem of individuals (Jonas, Fritsche, and Greenberg 2005) and in turn reinforces the alternative economy.

7.1.3. Meaningful Domestics and Gender Equality

In this section, I suggest a different approach to the rights of women that would help broaden modern definitions of an empowered woman. This is based on the women in my studies who felt like their decision to become a maker, stay-at-home mother, or housewife has been disparaged by other women in their lives.

There are various feminized externalities in economics (Chant 2011; Mammen and Paxson 2000; Oksala 2015; Rosenblum 2009; C. L. Williams 1993) such as cooking, cleaning, volunteering, and the ‘mental load’⁵ (Wade 2016). These facts suggest that women’s rights, in general, are important. However, the voice of women is missing from ecological economics. The top authors since the inception of the journal are all male, except one – shown in Table 10 (Arruda and Dolter 2016).

Table 10: Individual Researcher Representation in the Journal of Ecological Economics from 2000-2013

Name	Counts	%	Cumulative %
1. William E. Rees	8	2.47%	2.47%
2. Kai M.A. Chan	7	2.16%	4.63%
3. Jack H. Ruitenbeek	7	2.16%	6.79%
4. G. Cornelis van Kooten	6	1.85%	8.64%
5. Ussif Rashid Sumaila	6	1.85%	10.49%
6. Peter A. Victor	5	1.54%	12.04%
7. Robin Gregory	5	1.54%	13.58%
8. Shashi Kant	5	1.54%	15.12%
9. Jie He	5	1.54%	16.67%
10. Oliver T. Coomes	4	1.23%	17.90%
11. Terre A. Satterfield	4	1.23%	19.14%
12. Meidad Kissinger	3	0.93%	20.06%
13. Sarah C. Klain	3	0.93%	20.99%
14. Robert D. Cairns	3	0.93%	21.91%
15. B. James Deaton	3	0.93%	22.84%
16. Qi Feng Lin	3	0.93%	23.77%
17. Denis Cormier	3	0.93%	24.69%

⁵ The ‘mental load’ consists of all the things a woman, typically a mother with multiple children, keeps in her mind at all time such as everyone’s schedule, shopping lists, to-do lists, due dates, paper work for the government, schools, and work – all while sometimes holding an additional full-time job.

And yet, most of the participants in the Maker Culture case studies were women. I postulate that this is because women more often play the role of on-the-ground actors of ecological economics. As such, women need to have an active voice in how their gender role and ecological political economy evolve over time.

Counter-intuitively, modern feminism may be creating a barrier for women's roles to evolve in necessary ways. For example, Janet Biehl argues that some ecofeminists come off as "enraged...goddess-worshipping and anti-intellectual", undercutting its important role in "activism and its theoretical potential" (Clausen 1991, 346). She goes on to say that there is a tendency to defame "oikos [home] and its value as a substitute [and complement] for the polis". This was supported by the women in the Maker Culture case study in the quotes highlighted in section 6.3.2: some women commented that their decision to quit their job or to be a stay-at-home mother was shamed by other women. However, the glorification of *oikos* may be very important for evolving relationships between the social and economic sphere to produce greater sustainability practices.

When women joined the workplace in the 1950s, family organization began to change to a more nuclear structure and work became a central (politic) operating unit in the household, leading to instant meals, less time with children and more time commuting. This capitalist structure, which most want to succeed within, is setting women up for an unfair choice – on the one hand there is pressure and desire to have a career, but also the strong biological and emotional desire to have children. For some women in the Maker case studies, this tension hit home when they left their jobs to be stay-at-home mothers and were berated for that decision. It's time to re-evaluate the way we see 'success of a woman' in society. I am not suggesting a reversal of this process, but rather to explore and uncover ways that women can bring *polis* and

oikos together in a radical way. Also, let's take seriously giving individuals more time for family or meaning-making pursuits. The Swedish model is to normalize work sabbaticals for both genders as well as parents and employees without children – giving everyone more time for life.

The vital role that women have in 'saving the planet' is in what I called a 'radical poli-oikos' (Table 11) – a radical, life-giving, care-providing, self-sustaining politic. I'm not arguing that every woman should, or needs, to do this. Instead, those who already do stay-at-home or choose less stressful careers should be heralded as activists going against a strong system, and against the economy of care (Mahon and Robinson 2011). Women should be able to be proud to choose family over work, and by establishing a politic around it, they may see the power and importance of their actions.

Table 11: Characteristics of a polis-oikos

Social	Economic	Environmental
Re-establishing an embedded relationship between family and economy	Lower income	Less commuting
Community volunteerism	Internalize feminised externalities (e.g. mental load; child care)	Lower energy throughput
Reduced maternal anxiety	Universal basic income	Reduced material flow
Intergenerational care (for both elderly parents and younger children)	Establishing early values in life over work	More opportunity to instil an eco-identity in children
Increased self-esteem	Reduce load on social services (childcare/subsidies)	Less processed and pre-packaged food, less food waste
	Less consumption (fewer tax transfers)	

There are important connections between how women are treating themselves and environmental destruction – the competition between women and the desire to transcend women's biological roles, is, in some instances, detrimental to families and society. This is a difficult argument to make because it sounds inherently anti-empowerment. However, an ethic of

motherly care and polis-oikos can pose a serious threat to social hierarchy and domination, if modern feminists allow it to.

Judith Butler made a famous claim against other stay-at-home movements - that not all women are mothers: “some cannot be, some are too young or too old to be, some choose not to be, and for some who are mothers, that is not necessarily the rallying point of their politicization in feminism” (Butler 1992, 126). I hypothesize that for others, motherhood and partnerships can function as a political rallying point, and that the status of being an ‘empowered woman’ can, and should, also be applied to women who choose to be mothers and/or to contribute to the home economy.

Framing motherhood, care, and feminized externalities as ground for a radical politic provides fodder for policy development around social services, universal basic income, and tax bracketing. Changes in these policies could help support both women and men in working from home. This approach also begins to bring forward the web of connections between community, empowered women, and environmental protection. The historical example of the Love Canal⁶, where environmental activism was led by women, suggests an interesting area for further research and reflection (Newman 2001). I don’t explore this history and its relevance to my research, but it is an interesting area for future research. There is also opportunity for research in how indigenous people, women of colour, and environmental justice activists can accompany and contribute to a radical polis-oikos.

⁶ Love Canal is a neighbourhood in Niagara Falls, NY that was the dumping site of the Hooker Chemical Company from the early 1940’s until 1951 when the land was sold to the region’s school district to meet the needs of a growing population of children. Mothers in the neighbourhood are credited for recognizing patterns of health concerns in the children in the area related to living near the dump sites (Newman 2001).

7.1.4. Education

The EEDG of education is complex and multifaceted. Education came up in all case studies in varying ways. In this section I explore some of the participants' views of education, discuss ways that education has changed during the process of modernization, and offer suggestions for immediate changes to education systems. These suggestions are based on an interview I conducted with Tim Grant, the founder and current publisher of a magazine, *Green Teacher*. Grant was suggested to me when I approached the Toronto Eco-School Network to discuss some of these topics. What appears in this dissertation are pieces from an interview that will appear in an upcoming publication (Kish 2018).

As part of my research in PEI, I spoke with boat builders on the coast of PEI, who also work in Maryland. They devote their lives to traditional crafting of boats. One of the men involved with this work said, "education is failing children – we see high school students who want to come and work with us and they show up never having used a hammer and without the spatial skills to understand how things fit together" (PEI 14). He went on to tell a story about how one student came to work with them but had no physical skills, so his contribution was to create a 3D model of the boat on his computer. "This kid spent hours creating a model of a ship that we could all see in our heads. I'm not sure what the point was."

City 1 expanded on the topic of education:

"The kid thing is a funny piece, I thought we'd have more push back. If you invest in kids they're not going to contribute to the economy in a meaningful way until they're older. We have action items – we invested in the kid's Makerspace at the MUSEUM and we support the maker expo, and support discovery square which is focused on STEM for kids. There is a lot of programming like that which we support and it's an investment into our future."

They went on to suggest that doing these programs empowers kids, an idea supported by our Metcalf workshops. That empowerment doesn't necessarily mean that they need to become a

crafter as a profession, it means that it has given them confidence and the ability to control their environment and “it gives children the ability to unlock their world and activate problem solving” (City 1).

City 1 and 2 both focused on children. City 1 says that this is because “communities shape kids”. When a child grows up in a community with a university, it contributes to the overall culture. The university students will be at their elementary school, putting on programming, and that industry will just be a more likely place that a student goes. It is the duty of the city to make that culture as enriching as possible, and that doesn’t have to be through education:

“You shape your life on small instance, not big repetitive things. Your daughter sees the activities at Maker Expo, it’s so exciting for them and they only see it a few times a year but just that one time can be highly influential. All kids need is one small experience to change their life and give them direction. You can build a relationship very quickly if the experience is positive. Just because the school system isn’t immersing them, it may be enough that they get exposed to it once or twice. My son did a six-week mad science program and it was enough to make him fall in love with science and have a really focused goal. When we think about the moment that made us decide to do something, sometimes it is just that one experience other times, if you’re surrounded by things, it might actually be less noticeable and saturate over time” (City 1).

In a completely different vein, 100% of the preppers and homesteaders participated in homeschooling, and were reluctant to discuss their reasons why and the kinds of things they teach at home. Some suggested that the school system was not equipping their children with the right kind of education, while others (all homesteaders) suggested that education is best internalized to continue to build a strong internal community.

City 2 added to this, arguing that there “is a big missing piece in the arts education world in Canada for those sorts of people [boat builders] ... Wood working used to be about skill, but now it’s about doing frames for shed, not dovetailed latches.” This shift toward education focusing on utility was echoed by 7 other parents.

For most of humanity's time on Earth, the process of learning was tied to life and relationships. People learned skills and routines through experience and their pattern of life.

Education was not a process of preparation for life, it was a part of life's journey. In

modern society, the situation is almost entirely reversed (Quilley 2017). In 2010, Sir Ken Robinson, a world thought leader in education, released a provoking Ted Talk called "Changing Paradigms in Education." In it he said:

"I believe we have a system of education that is modelled on the interests of industrialism and in the image of it. I'll give you some examples. Schools are still pretty much organized on factory lines – ringing bells, separate facilities, specialized into separate subjects. We still educate children by batches. You know, we put them through the system by age group. Why do we do that? Why is there this assumption that the most important thing kids have in common is how old they are? It's like the most important thing about them is their date of manufacture."

Robinson's talk points to an emerging sense that education is no longer fit for its purpose. He argues that the Enlightenment-bias towards abstract and deductive education have all contributed to an education system that stifles creativity (Robinson 2013). He is not the first person to acknowledge the idea that the severing of hand (technic education) and brain (academic education) detracts from well-rounded development of individuals; nor to argue that this was originally driven by the functional requirements of the industrial revolution (Illich 1970; Sale 2017; Kropotkin 2014; Marx 1964; Morris 1883; Ruskin 1854). In his upcoming publication, Quilley reflects on the role of literacy and education in relation to state formation:

"Mass literacy and education both create, and are required by, a standardized written lexicon; and to this end, standardized education is perhaps the single most important function of the modernizing nation-state. Massimo D'Azeglio, an advocate of Italian unification, once famously commented in 1861 about the Risorgimento ... that, 'having made Italy, it was now necessary to make Italians'. He meant that the population needed to be educated on how to be a part of Italy. This is how states produce "nations". The nationalization of culture can be seen as a process by which higher education is universalized and extended to all of society."

(Quilley 2018)

Capitalist modernization has inextricably linked economic growth to social processes – including education. Education is focused on providing highly transferable skills for citizen-workers. It has become entirely instrumental in character and preparatory in function. Students within the system are focused on their individual success and the position they will fill at the end of their educational career. They are separated from relationships of family, community, and place. This leads to significant ‘choice’ in terms of deciding which occupational educational path one will take. I discuss later the implications of ‘choice’ on individuals.

This process of education is upheld and engrained alongside a progressive rationalization and disenchantment of the world, first identified by Weber (1921), and more recently by various scholars (Agrawal and Gibson 1999; Berman 1982; Bettelheim 2010; Healy 2011; Landy and Saler 2009; Schroeder 1995). ‘Disenchantment’ is a cultural devaluation of myth and shared ontology in favour of an instrumental, scientific and goal-oriented culture (Weber 1958). Whilst I would not suggest that the movement toward science-based decision making is a negative trend, an increase in rationalization increases the pervasiveness of the ‘world of things’ via innovation while contributing to the need and desire for experts in specific fields. Scientific models and patterns of rationalization have functioned as powerful drivers of social and economic progress – not least through the development of technology. But that rationalization has come with a price. In relation to TMT, science engenders an extraordinary capacity to intervene in the real world but undermines the shared ontology and the meaning frameworks through which individuals understand how to act in that world. As the encompassing mythos generated in hearth cultures and later the religious high culture of the official Church recedes, the responsibility for shared and unitary orientations and modes of perception passes to the state. Informal processes of acculturation then give way to institutionalized processes of education.

For these reasons, education is very central to the processes of modernization. Ernest Gellner (1988) comments on this:

‘A society has emerged based on a high-powered technology and the expectancy of sustained economic growth, which requires both a mobile division of labour and sustained frequent and precise communication between strangers involving a sharing of explicit meaning, transmitted in a standard idiom and in writing when required. For a number of converging reasons, this society must be thoroughly exo-educational: each individual trained by specialists not just his own local group’

(Gellner 1988, p. 33)

Given the education system’s role in creating citizen-workers, it is potentially a powerful entry point for ecological economic change.

In his speech-turned-book, John Taylor Gatto, a former schoolteacher who is now one of the top education commentators, said that it is “meaning, not disconnected facts” that humans seek (Gatto and Moore 2002, p. 72). And yet, our education system still focuses on these disconnected facts and prescriptive career paths, rather than developing meaningful cognitive relationships with ideas, histories, and practices.

While the importance of alternative approaches to education is well-established (Beard and Wilson 2002; Gosen and Washbush 2004; Mezirow 1997, 2000; Snyder 2008) and has led to the reinvigoration of some movements (i.e.: homeschooling), most kids are still taught in institutionalized settings. Critiques about institutional learning stand ground, but they don’t help most sympathetic teachers caught between their desire to provide more enriching education within the institution and the restricting rules and regulations of schools.

Grant argues that the role of progressive educators is to push the processes as much as possible and continue to show that kids learn better when they have freedom and are motivated to improve the world around them. He suggests four trends in Canadian environmental education that are potentially paving the way for better education – all of which making could tap into.

Trend One: Teaching Critical Thinking: Initially, environmental educators assumed if you told people about the problem and associated implications, they would change. This turned out not to be true and they may be driven to defend against such negative messages via consumption. In education, this is even more problematic because it needs to be expressed via a diversity of perspectives. One important way to ensure children and adults can wade through these opinions is with critical-thinking skills.

Trend Two: Establishing a Love of Nature: David Sobel from Antioch University's New England campus coined the phrase "no natural disaster before grade four" (1999, 27). This is for the same reason as above – these messages trigger fear and anxiety, not motivation for change. It is critically important to help develop a love of nature in young people. Once that love is established, the students are more likely to respond to natural harm in meaningful ways. This has led to a very recent trend called 'forest kindergartens', which are kindergartens where most of the children's time is spent outdoors. This is reorienting a child's relationship with nature, and their ability to perceive risks and safety.

Trend Three: Integrated Learning Programs: Recently, high schools in Canada began incorporating a new program called the Integrated Learning Program, in which students have the same one or two teachers throughout their entire year, rather than changing teachers for each subject. This has many benefits, especially for creative education practices given that this unties students from having to be in the school all day. Students in this program go on trips to places like provincial parks in the first week of September. This movement addresses the problem Gatto famously identified - that schools are inherently career-oriented and the end goal is to send kids to university. This orientation is a disservice to teenagers because it leads to a focus on

memorization and a disservice to the environment as it perpetuates the cycle of consumption and capitalism.

In contrast, a canoe trip in the Algonquin Park teaches students about responsibility, problem-solving, teamwork and self-organization. Grant noticed the less academically inclined kids tended to shine the most. Students who participate in integrated learning programs perform better academically when they return to regular rotation because they return reinvigorated to learn. A similar research outcome is demonstrated in the State Education and Environment Roundtable (SEER)'s 1998 Closing the Achievement Gap.

Trend Four: Action Oriented Learning: There is an emerging awareness in education that only through action can kids learn about barriers, the skills of negotiation and the skills required to be a citizen. To do this, the role of action in education becomes very important. In traditional education, students learn, and then move on to the next thing. But environmental educators have realized that action must be central to education. When students learn about problems without a follow-up of applied action-items, they come away feeling apathetic and that the situation is hopeless. However, Grant has observed that when students are given the freedom to apply what they've learned and do something about a given situation, their minds open with possibilities.

In addition to these insights from Grant, in my research results I also saw a need for education that is focused on the long-view to establish an emotional relationship with the world, a call for greater open-source education initiatives to create education that is accessible to all, and a greater role of mentors and relational learning. While these connections were observational and not discussed with my participants, they represent primary topics of interest for future research.

However, there is a challenge to new approaches to education. Pinker refers to the ‘escalator of reason’ as the intensifying application of rationality and knowledge in everyday life (Pinker 2012, 699). The escalator of reason is bolstered by increases in literacy, cosmopolitanism, and increasing rates of education, all of which is dependent on growth (Singer 1981; 2011). Understood as emerging from the progressive rationalisation of society, the escalator of reason creates the conditions for scientific progress that have resulted in significant increases in well-being and technological innovation (Pinker 2012). These were achieved by prioritizing rationality and modern institutions over religious dogma (Eliade 1987, 58, 23) and the coercive imposition of a national ‘high culture’ via the education system (Gellner 1983).

The progressive rationalization of society is a root cause of modern efficiency, problem solving, and maximization of resources (Grosby 2013; M. Weber 1921). A good example is the rationalization of food production. Making food from scratch was laborious and inefficient, at least by the standards of the mass market – fast food services make it efficient, predictable, and controllable while at the same time contributing to environmental degradation and a range of social and health issues. There are always trade-offs. Pre-modern food systems may have been associated with local or regional episodes of starvation and food-borne illness; but globally-integrated, manufactured and fast food systems have engendered an obesity epidemic. The question comes back again to whether or not there is a ‘sweet spot’ for humanity. Can we use science to improve our systems without it having negative impacts on society? The question I am most concerned with, is the extent to which the escalator of reason may be, at least partially, independent of these other processes of rationalization.

Many urban Makers, especially those at the One of a Kind Show, entertained ostensibly anti-scientific views in relation to parapsychological phenomena such as ‘auras’ and the

‘spiritual cleansing’ of their gems. Conversely, PEI Makers were typically very well educated and scientifically literate. This might have to do with the level at which the Makers were involved in production. Urban Makers selling on Etsy tend to buy their materials online while rural Makers tend to procure their materials directly from the source, or trade directly with someone who does. For example, in describing her creation process a One of a Kind participant mentioned ordering her glass beads from a retailer in Vancouver while a PEI participant demonstrated to me her process of making her glass beads from sand, she said she “believe[s] is making as a holistic process from start to finish” and that she spends “more time making raw materials than actually making that final product” (PEI 6). The PEI participant is actively involved in the scientific changes involved in her production while the One of a Kind participant is removed from it. This is likely a function of rural Makers embeddedness in community; it seems to come part-in-parcel with a more holistic approach toward making. Urban Makers were also more likely to prescribe to homeopathic medicines. However: I only started asking about this half way through my interviews, so I do not have complete data.

While I did not explore this theme at length, my hope is that this is a space where society can figure out what is really needed and not needed so that science, reason, and rationality are not lost. I’ll continue with my example of health systems. Without continued funding, the current amount of scientific medical research could not continue. There is a question here about how much of that research must be done, how much could be reduced by changing other factors in society, and what hospitals require to function at the level they do now.

It is conceivable that without capitalism, there could possibly be a loss of technological/social progress (reason/science) due to critical capacity for research and necessity for innovation. It is possible that there is a tipping point where many structures of medical

infrastructure would fall apart. I would hope that there is a way to live a globally low energy lifestyle while still exploring the reaches of space – I don't know if these are incompatible and would be part of future research into the tension between biocapacity and SDGs.

7.1.5. Redefining Success

'Redefining success' is a well-developed concept in ecological economics based on two lines of argument. First, ecological economists suggest happiness and emotional well-being does not increase beyond an annual income of approximately \$75 000 (Kahneman and Deaton 2010). This suggests a need for looking at patterns of financialization (how we deal with money), the role of bartering/gifting instead of measuring purchasing power, and the role of money. Second, ecological economists have general criticisms of GDP which emerged as a measurement of success during an era when resources seemed unlimited, the environment was viewed as an externality, and quality of life was highly associated with higher economic standards of living. It is widely accepted that the GDP is not a good indicator of progress (Dietz and O'Neill 2013), and that the very assumption of 'growth' is outdated.

The need for a redefinition of success and progress has percolated into social and civil society. For example, at the 68th Session of the UN General Assembly in 2013, Ban Ki-moon submitted a report for discussion titled 'Harmony with Nature'. The report argued that to achieve harmony with nature, society must accept limits to growth by learning from deep ecology, systems theory, and key drivers of sustainability including equity, justice and universal rights. To do this, Ban recommends redefining success by promoting broader measures of progress. ecological economics contains various methods to employ broader measures of progress and success such as the Genuine Progress Indicator (GPI), The Index of Wellbeing, and the Index of Sustainable Economic Welfare (Lawn 2003). These indicators demonstrate a very different

picture of developed countries from GDP. For example, the Index of Wellbeing, developed at the University of Waterloo, includes eight domains of life relevant to livelihood and wellbeing, rather than economic measures of success. Since 1994, Canada's GDP has increased 38% while our Index of Wellbeing has only increased 9.9%.

These broader tools for redefining success are important for recommending how governments should approach their policy developments for 'progress'. However, individuals also need to redefine success, which is difficult, because this is asking for a shift in culture. In an reembedded economy the *substantive rationality* of social action rather than *formal rationality* of economic allocation mean that success is not simply about profit or any single factor, but always by a range of relationships in the community. In ecological economics redefining success is currently done through top down policy initiatives such as inclusion of GPI; whereas the emergence of a new culture with new relationships between the state, market, and families might redefine success from the bottom up. From this view, redefining success means being a part of a much larger commitment to cultural change.

Participants in the case studies demonstrate that being embedded in a community, having more family time, and participating in self-esteem bolstering activities helped them redefine success in life. Most of the economic applications that could help support these approaches for redefining success have previously been mentioned, and are the more typical ecological economic approaches, including: use of GPI, the four-day work week, income capping, encouraging local currencies, and creating spaces for gifting, bartering, and trading (i.e.: swap shops, sharing economy, peer-to-peer selling platforms).

Among my informants, Making gave the participants fulfillment because it played a similar role as religion and ritual. A few participants used Making as a way to understand and

“communicate” their “understanding and vision of how the world looks to me” and to their “sense of the world” (City5, PEI 3). City 9 described this process as bringing together “fragmented thoughts and feelings” about the world because “developing the basic raw materials for the work is deeply reflective and informative. I can feel why I am doing this [making] instead of something else”. PEI 4 said that making helps her “make sense of the world by connecting to it in a new way” and asked, “how can we teach that to our kids and help them understand how to respect the world?” She argued that crafting can do that, that crafting “helps kids and adults understand how we fit into the particles flying around us and how we can manipulate them into something really cool”. OOKS 8 answered this question in a similar way stating, “so many millennials are left with an empty spirit, but with making we can garner an appreciation for the planet because we respect the products produced from it, so much more”.

Given the apparent mass appeal of making and its ability to become a spiritual element for some, this points to the promising potential of Maker Culture to be a foundational element of greener and perhaps more restrained modernity.

Another redefinition of success could be a simplifying of childhood. Many parents over-stimulate their children out of a sincere belief that it is for the child’s best interest. In John Payne’s book *Simplicity Parenting*, he explains four pillars of excess (2010): 1) too much stuff, 2) too many choices, 3) too much information, and 4) too much speed. Now, the habits of Western children are completely built on a throw-away consumer culture. A common problem-solving tactic for ecological economists could be a recommendation for reducing the number of extra-curriculars, ‘things’ and expectations in a child’s life. Some ways forward may be to suggest that children are only enrolled in one extracurricular or create social rules around the amount of homework allowed or to encourage community events with family friendly activities

– at a Maker Faire, children would also learn the value of creation and the work/energy that goes into making something. However, a more holistic solution would be more inclusion of free-range parenting and schooling that is focused on reconnecting the hand and brain. Making as an extracurricular reinforces the mechanisms of today’s education; a deeper transition would see making reemerge as an aspect of community acculturation.

7.1.6. Community

With Daly, I agree that the role and strength of a community within which an economy is embedded is important (1990, p. 9). The reason that many of the EEDGs are more evident in the rural case study is because they had a stronger community with which to care, encourage strong mental health, reform education, and collectively consume. In this section I explore the importance of community, processes that undermine community, possibilities from the research for reigniting community, and the problem of localized community versus global empathy.

In 1938, The Harvard Study of Adult Development began collecting data on what makes people (men, specifically) happy and healthy. The results of their longitudinal study found that, without a doubt, what keeps people happy into their old age is strong and healthy relationships (Waldinger and Schulz 2010; Waldinger et al. 2015). Waldinger and his research group found that tending to one’s relationships is a form of long-term self-care. Strong relationships protect people from depression, delay declines in mental and physical health, and are a better predictor of happiness than class, IQ, or biology. There is a strong link related to marital relationships, but Waldinger also found that women with secure attachment to their parents were less depressed and happier with better memory functions than those with less secure attachments. In his TED talk, expanding on his extensive academic writing on the subject, Waldinger claims “Loneliness kills. It’s as powerful as smoking or alcoholism”.

These initial findings came into public attention seven years ago, and yet the importance of strong community and relational bonds are still not actively encouraged. When buying a pack of cigarettes, consumers are faced with images of cancerous lungs and children inhaling smoke, but when we log onto our computers we are greeted with happy AI assistants such as Cortana and Siri, or pleasant messages from Facebook wishing us a good morning. Perhaps there should be images of depressed, jealous, and unhappy individuals on these sites, reminding us to cultivate and tend to our relationships. While this sounds farfetched, a 2014 study found that social media use is directly correlated with lower rates of happiness in relationships and high divorce rates (Valenzuela, Halpern, and Katz 2014). While there are some social benefits of social media (such as reducing barriers for those with social anxiety (Steinfeld, Ellison, and Lampe 2008)) there is evidence that it creates artificial relationships rife with jealousy and bullying while decreasing happiness and efficiency in work life (Muise, Christofides, and Desmarais 2009; Brooks 2015).

If social media interrupts our relationships, and relationships are a key to wellbeing, happiness, and health later in life, there is a strong argument for state intervention in the amount of time spent online. However, the opposite is happening. When individuals watch television, read blogs, see advertisements, or even attend public lectures or government sponsored events they're encouraged to tweet, use the event's hashtag, and follow along on social media – there is cultural force to discourage community by continuously encouraging use of social media to engage with others.

The pervasiveness of social media, despite its negative impacts on wellbeing, is attributable, in part, to the role it plays in providing rapid information and increasing consumerism. Social media assists in creating a strong bond between brands and consumers

(Hutter et al. 2013; Laroche et al. 2012; Laroche, Habibi, and Richard 2013). It plays a strong role in helping individuals curate and solidify their identity amongst peers and assists brands at targeting the individuals who would most want their goods. Social media therefore plays a strong role in the perpetuation of individualization, self-obsessed identity development, and consumerism. Consumption is designed as a central vehicle to communicate self-identity, an obsession of many in modern society (Waugaman 2011).

In *Risk Society*, Beck begins with the notion of reflexive modernization (1992), which is a process wherein tools of modernity (such as technology or science) are continuously used and innovated in an attempt to counteract the problems engendered by previous rounds of modernization. Modernization is applied to itself as experts attempt to control or predict a range of unpredictable and complex risks. Beck goes on to apply the notion of reflexivity to an intensification of the process of individualization. He argues that this happens in three stages (1992, p. 128): 1) disembedding, or removal from historical forms of commitment, 2) loss of traditional security in relation to practical knowledge, or knowledge communicated inter-generationally or via faith systems (what Gellner calls ‘acculturation’) and 3) a new type of social commitment emerges wherein individuals “become the agents of their own livelihood mediated by the market” (1992, p. 130; and facilitated by rationalized systems of formal education). This process is exemplified through the process of farmers migrating into cities during the Industrial Revolution. Through this process, the individual is removed from traditional relationships (family, face-to-face relationships), which are exchanged for a place in the labour and consumer markets. These traditional relationships are then replaced by secondary institutions resulting in an individual’s dependence on “fashions, social policy, economic cycles, markets” (1992, p. 131) – this despite the fact that the same individuals believe that they are experiencing

greater freedom and choice. Within this process, individuals shift increasingly from a prescribed to ‘elective biography’ (Giddens 1991) – meaning they are increasingly forced to choose and mould their social identity and bolster that via consumption.

The question is what kinds of imaginative futures help to shift culture so people will give up easily identifiable markers of success for something equally gratifying but less environmentally harmful? From Beck’s perspective, appropriate measures might include limiting time on social media, and re-establish face-to-face relationships. In some instances, PEI participants do this because it comes with community commitment. This links back to Daly’s initial argument that community is the most important determinant of a socially responsible economy. If a group of people have a strong community, there may be a greater change that the local prefigurative politic will take hold because there is critical mass. Therefore, in community settings, self-esteem inducing behaviours such as making can flourish more freely because it feeds into the larger project of community success. This explains why Makers in PEI were more likely to share or gift their goods, and commented more regularly on the important and vital role community plays in their lives, hobbies, and livelihoods. Those in stronger and more holistic socio-economic settings were more likely to demonstrate inclinations towards the characteristics of the ecological economic social sphere that I have laid out.

Makerspaces thrive on a community feel, and people will often go there just to hang out. 91.6% agreed that being a part of the Makerspace was an important part of their extended community (by a show of hands). When entering into a Makerspace I always felt very welcome and came to really like the maker community in Kitchener. The events were always vibrant with friendly faces welcoming people in. City 1 said that it is the community of making that has made Kitchener so strong in the face of manufacturing and labour changes over the past 40 years. They

claim that a local Kitchener company will always try and find other local Kitchener companies to take people on if they're going to close. Blackberry employees were absorbed by the starts ups at Communitex through the help of the city. City 1 said that this is the heart of a maker community and that that approach is integral to having a city that is able to transition through economic phase changes.

While community orientation is an extremely important characteristic for the achievement of a low-growth society, it also presents one of the biggest challenges.

For hundreds of years following the French Revolution, the streets and countryside were still filled with peasants speaking regional dialects with no association or connection to 'France' as a country (Weber 1976). Between 1870 and 1914 a series of new and linked administrative and regulatory regimes fell upon the French countryside namely the judicial system, the church, roads, a market economy, and the school system. The result was a transformation of these peasants into 'Frenchmen' who spoke Parisian French, had national pride, and would fight for their country.

This process happened all over Europe as (implicit) social contracts were built between the European population and the state (Gellner 1983). An important social contract was the state's control over violence. Supported by military institutions and police agencies, the modern state promises a general expectation of peace – unlike our ancestors, we normally worry much less about our neighbor killing us for our food or other reasons.

Some of the participants in the Maker Culture study, specifically those who have made 'making' into their family's entire livelihood (preppers, homesteaders, 3 additional Makers), question this contract. These participants were beginning to develop 'outgroup antagonism'

evident through statements such as “I have guns for when it gets bad”; “When it comes down to it, only my family matters at the end”; and “I don’t mean to be mean but if we keep our borders wide open we’ll be in a real pickle”.

In a low growth society, it is conceivable and even likely that military and police forces would be much smaller. Military and police expenditures are often quite large, and with fewer tax revenues to support all systems, it, like most government services, would potentially need to contract. However, over time, microcosms establish ‘we’ (insider) and ‘they’ (outsider) images that reinforce divisions between small groups (Elias and Scotson 1994).

In a pre-modern and place-bound society, a person’s empathic circle contained only their primary community as this was their necessity for life (Berman 2000). Extending empathy to other individuals outside of this circle is driven by industrialization. As working-class consciousness evolved, individuals outside of family units began to unite and relate over class-based conflicts. Through individual emancipation, built on the growth of the economic liberal democratic society, people began to identify with the culture of self-actualization (Marcuse 1964). Additionally, toward the end of the 1960s, new social cohesion formed around globalized risks faced by an increasingly interconnected global community (Beck 1992). This helped to extend an individual’s empathic circle (Ehrlich and Ornstein 2012; Rifkin 2009). Ehrlich and Ornstein argue that empathy has been the primary driver of human progress calling for us “to emotionally join a global family” (2012, p. 5). Similarly, Rifkin asks us to make a leap to “global empathic consciousness” as this is the most likely way we’ll save the world from environmental destruction (2009, p. 42), yet recognizes that “the tragic flaw of history is that our increased empathic concern and sensitivity grows in direct proportion to the wreaking of greater entropic damage to the world we all cohabit and rely on for our existence”. Similarly, Elias (2014 [1939])

argued that social complexity and growing intensity of interdependencies between individuals and groups, alongside state monopoly of violence, led to the internalization of external constraints and engendered a more pacific personality structure and a profound reduction in interpersonal violence.

In a time of de-growth and perceived scarcity, this could potentially breakdown processes of extended empathy as individuals would turn inward, protecting their family and immediate community, which could lead to significant civil unrest. Rifkin rejects this to some degree, arguing that as ‘homo empathicus’ humanity has a tendency towards conviviality and collective nature. On the exact opposite side of that argument, Elias’s thesis suggests that any loss of complexity and sustained reduction in interdependency would lead to loosening of internalized controls – violence in particular (Mennell 1990). Pinker suggests that the five ‘inner demons’ of humanity (all centered around violence) are only at bay because of five historical forces that favor humanity’s peaceful motives: the leviathan, commerce, cosmopolitanism, feminization, and the escalator of reason (2012) – all of which are upheld by the growth paradigm. For example, Pinker points out that the likelihood that a country will be torn by “violent civil unrest...starts to soar as its annual per capita domestic production falls below \$1,000” (p. 682).

7.1.7. Thoughtful Consumption

Controlling the way people consume is difficult, but consumption plays a critical role in the development of how people see themselves and in supporting local artisan Makers. In this section I continue looking at the role of the individual in relation to consumption and present statements from participants as to why thoughtful consumption can be encouraged through making.

Anthony Giddens and Zygmunt Bauman expand on the relationship between consumption and self-identity remarked on by Beck in the previous section.

In *Modernity and Self-Identity* Giddens examines the difficulties individuals face in sustaining those chosen identities (1991). He argues that a main feature of the modern experience is the construction and maintenance of self-identity as a narrative of the self. One of the biggest challenges to individuals in this experience is the great deal of choice people are presented with, accompanied by very little assistance in knowing what is the best choice. This is the reason why marketing and brand relationship building is so vital for companies. By using social media to develop relationships they are ‘assisting’ individuals in making the choices that are necessary for ‘designing’ or tailoring an identity. Giddens goes on to argue that individuals become so obsessed in this process, and so susceptible to advertising, that consumption develops into a substitute for “genuine development of self” (1991, p. 198). Given Giddens’s logic, ecological economists might consider expanding their ban on advertising to include brand infiltration on social media – which is incredibly difficult given that much of it is subliminal and advertising pays for a great deal of content that is online. In the film *Century of Adam the Self* (2002) Curtis explores how Freud’s theories of psychoanalysis have been used by governments and corporations to both create and fulfill the desires of the public. He makes very clear the extent to which, from the 1930s, psychological advertising and mass consumption simultaneously solved two problems: the problem of under-demand and the need to constantly create artificial needs and desires so as to sustain high levels of economic activity; and the problem of the political integration of individuals in an unstable mass society. With regard to the latter, and working for the American State Department, Freud’s nephew and pioneer of psychological advertising

Edward Bernays argued that political consent could be manufactured by transforming rebellious citizens into passive consumers.

Bauman's *Freedom* (1988) teases out the dilemma by demonstrating that freedom is a double-edged sword. On one hand, individuals are potentially free from oppression and able to make choices, but on the other hand, freedom can be very stressful, and there is a tyranny in choice. With the decline of traditional relationships and faced with the overwhelming choice of how to 'present the self' (Goffman 1959) outside of that traditional context, the individual is left with insufficient 'rules' of the self (traditionally provided by immediate relationships) within a society with endless social expectations. Bauman explicitly makes the link that advertising takes advantage of the anxiety felt by individuals caught in this predicament (1988, p. 62) by helping to alleviate the stress of choice. The market offers both uncertainty/anxiety and freedom/certainty, all at the same time. Citizens then become increasingly less skilled at navigating these complexities of choice as they allow the market to choose for them, essentially allowing the market to shape who they are as a person.

These processes all begin with individualization. These three scholars demonstrate that by the 1990s, individuals in search of community had integrated themselves into society via consumer behaviour to design and manage social identity. Consumption has effectively replaced community as the vehicle of social integration. And thus, these processes that discourage community and perpetuate the cycle need to be included in evaluating the relationship between society and the environment. If a society is deeply embedded in this system of manufacturing self-identity via consumption, ecological political and economic interventions should potentially attempt to break this relationship for the benefit of both the environment and wellbeing of individuals.

The role of ‘thoughtful consumption’ could play a significant role here. I’m referring to consumption that is focused on needs, the purchasing of special products, and buying local as often as possible – as well as a ban on advertising. One participant remarked on this, suggesting that once citizens own the means of production, there would be greater likelihood of a reduction in consumption overall because there would be fewer, higher quality, and repairable goods for citizens to consume.

City 2 argued that that this is important because people are beginning to crave “something special and physical, not just virtual and disposable. People want things that have meaning and are special, something that will last. There is a growing desire to have fewer, but more meaningful things”. 14.8% of the participants referenced individuals that bought a piece of their work for something special such as wearing the necklace at birth or commemorating a special moment in their life. I purchased a necklace from one of my participants with the birth gem for my daughter, who was born just a few months before I conducted my interview with this maker – I understood this desire to purchase something special to commemorate a special event in my life.

PEI 2 suggested that sometimes individuals fall in love with certain pieces because it brings them joy, and that “doesn’t often happen with mass produced materials that you would buy at a chain retailer. Then, the meaning goes even further, it becomes something in the consumer’s life that is a ritualized piece of their day. If it’s a mug, they use that special mug to drink every morning. If it’s a necklace, they remember something specific when they put that necklace on”. PEI 15 argued that therefore crafters thrive better in communities “because people know their story more. That’s the huge strength of selling at a local craft show, you can attach

the narrative to your piece and the experience and human connection”. However, consumption is a social structure and shifting one’s intention within that structure is very difficult.

7.1.8. Connection to Place

Disembedding is “the ‘lifting out’ of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space” (Giddens 1990, 21). As previously discussed, this leads to increased individualization, a decline in personal sense of purpose, belonging and ability, and more anxiety. Disembedding also decreases a person’s ‘sense of place’ because they are less likely to be geographically tied to a region. While the process of re-embedding craft is not mentioned explicitly, 25.9% of the crafters in rural PEI did suggest that they are embedded in place and that their craft is highly informed by that. PEI 8 said “the island is my muse” suggesting a connection with the land and PEI 12 said that she would “not be able to do [her] craft anywhere else in the world”.

‘Sense of place’ offers individuals, or in a premodern context it would be individuals through groups, a way to identify with a physical space (D. R. Williams and Stewart 1998). In some cases, an individual may develop emotional or spiritual bonds with certain spaces. For many people, the sense of place is developed alongside friendships and time spent with family (Kyle and Chick 2007). There are various ways that this sense of place is disrupted in modern society such as a less time spent outdoors, greater amounts of ‘structured’ outdoor activity (sports), mobility for school and careers leading to people moving, and greater fear by parents to allow their children to explore outside unsupervised.

An individual’s sense of place helps connect them to a sense of playing a ‘larger role’ in environmental management (Cantrill 1998) and directly leads to pro-environmental behaviour (Kudryavtsev, Krasny, and Stedman 2012). A central objective for ecological economists must

be to include or develop as part of ecological conscious formation, what Aldo Leopold referred to as a ‘land ethic’ (Callicott 2014). This suggests that ecological economists should nurture ‘psycho-social systems’ and include such systems in ecosystem service analysis. The idea of a psycho-social approach to restoration ecology suggests possibilities for this. The following ideas on this kind of restoration ecology are taken from a joint paper submitted to Ecology and Society with Davy, McCarthy, Murphy, and Quilley entitled *Restoration Ecology for the Anthropocene*.

As a discipline, ecological restoration was originally framed by the notions of balance, harmony, and equilibrium (Bocking 1997; Bramwell 1989; Sapp 1994). While politically appealing, this didn’t sit with dynamics of long time frames. Higgs (1997) argues that ecology requires a shift from emphasising ecological state to ecological function, which is a) variable over time and, b) explicitly normative in prioritizing the future of human society. This leaves the process of restoration as much more instrumental and means restoration and conservation must begin to incorporate the realities of economy and culture. Among restoration ecologists, a similar recognition of the growing complexities of restoration in the Anthropocene is apparent in the concept of ‘novel ecosystems’: “a system of abiotic, biotic and social components (and their interactions) that, by virtue of human influence, differ from those that prevailed historically, having a tendency to self-organize and manifest novel qualities without intensive human management. Novel ecosystems are distinguished from hybrid ecosystems by practical limitation (a combination of ecological, environmental and social thresholds) on the recovery of historical qualities” (Hobbs, Higgs, and Hall 2013, p. 58). Collier defines them succinctly as “anthropogenic landscape” that cannot be returned to their original ecological status” (Collier 2015, p. 1363).

Within the context of novel ecosystems there is no stable or pristine set of standards for an ecosystem. This makes priorities associated with restoration and intervention more arbitrary, which suggests a problem for restorative policy: there is no stable/natural state from which to base goals on as ecological integrity becomes increasingly difficult to define. This means that managerial restoration could become more susceptible to economic objectives. Considered in this way, a central objective for restoration should then be to echo the sentiments of Leopold's 'land ethic' (Callicott 2014). This suggests that alongside novel ecosystems we should nurture 'restoration ethics' (Table 12).

Underlying principles of this kind of approach include: longer time horizons when creating restorative plans; a planetary unit of analysis for restoration rather than specific regions (a similar argument was put forth by Morse et al. 2014); a feedback relationship between society, the biosphere, and economics; prioritization of function over state needs; and an ontological emphasis on self-organization. For example, an ecosystem service is currently measured by the freely gained benefits that nature provides to humans through an ecosystem.

A psycho-social approach to ecosystem services would ensure the ecological economist would examine the reciprocal relationship between humans and nature, look at a long view for that relationship, and prioritize the needs of humans and the ecosystem over state needs. This is similar to the argument put forth by Collier (2015) in which he argues that social values should be taken into account when creating restoration policies by incorporating scientific engagement.

The most important departure from current professional ecology on Table 12 is in relation to politics, scale and culture. The relationships in this table call for a shift in views regarding the relationship between the biosphere and society. This explicitly links restoration ecology to transformations in political economy and ontological frameworks produced through

culture. This means ecological economic approaches to restoration should consider questions about why people do what they do (possibly through a TMT lens) and explore how human populations can create relationships with space to drive restoration.

Table 12: Restoration ecology for restoring adaptive functional relations

	Traditional Restoration Ecology	Restoration Ecology for the Anthropocene
<i>human ecology</i>	Wildness = wilderness set apart from human society. Humanity autonomous, external/problematic and/or ‘in charge’; human time horizons dominant.	Wildness = self-organizing, autopoiesis, including human systems and biological processes occurring in close association with or in the wake of human activities. Humanity embedded, part of a larger complex whole; human time horizons subordinate.
<i>Ecosystem management goal</i>	Benchmark ecological states of behavior or organization	Desired ecosystem functions, processes, and relations
<i>Scale</i>	Localized zones or areas (i.e. a wetland)	Includes planetary unit of analysis in panarchic relations
<i>Temporal scale</i>	Shorter time scales and resorted to certain periods of time	Long time scale including evolutionary view of the biosphere
<i>Orientation to future and process</i>	Restored ecosystem balance and equilibrium, preserved for future	Self-organizing complexity: continuing viability of ecosystemic/evolutionary process into an indefinite future
<i>Wider practical orientation (i.e. the object domain for practitioners)</i>	Governance/regulatory changes to secure better management of ecosystems in relation to scientific benchmarks	Places as the intersection of ecology and culture. Ecosystem interventions linked to cultural change and ecological conscience formation
<i>Epistemology: knowledge, human interests and process of change</i>	‘Science’; expert-led	‘Culture’; popular, participative, and scientific
<i>Ecocentric value</i>	Prioritizes extant ecological diversity	Prioritizes continuation of ecosystem and social complexity
<i>Relation between designated object domains/study sites</i>	Separate, disjointed, and distant spaces	Meaningful places nested and indivisible. An ‘land ethic’ encompassing the biosphere. Bio-regional, place-bound expressions in local cultures of nature.

In *The Abstract Wild*, Turner (1996) argued that quantitative science is always associated with instrumental reason. Thus, restoration that begins with quantitative methods (i.e. tracking hunter harvesting data) inevitably leads to data used in the political process in a regulatory fashion (i.e. development of hunting regulations). Given this, restorationists could, and maybe should, develop collaborations working with cultural practise that embrace unconscious

motivations. For instance, experimentation with green hero projects (i.e. the cultural of footpaths and Freedom to Roam in the UK) and indigenous revitalization movements. This would be a broader framework for restoration ecology, not a complete reorientation of the field given that many of the processes in restoration ecology have to be quantitatively specific for the sake of science.

7.2. Summary of Chapter

In this chapter I presented a set of social parameters for thinking about the kinds of social characteristics ecological economists should try to encourage in the development of an imaginative future. The EEDGs culminate into a future vision for ecological economics that doesn't leave the poor behind and really considers the importance of roles that are currently viewed as less successful. A strong community and a connection to place help to re-embed individuals into their local biosphere, strengthening the human-Earth relationship. Within that relationship, strong mental health, systemic education, redefined success, and thoughtful consumption can flourish and reinforce that relationship. Ecological economics can support this by a) supporting open-source, local currencies, and 'free' knowledge as this is empowering and allows people who want to learn about something, to learn about it, b) putting the means of production back into the hands of citizens as making supported these EEDGs, c) include cultural restoration practices as an imperative of ecological economic decision making, d) enforce healthy work/life balances, and e) continue efforts to efficiently allocate resources especially in relation to innovation.

These EEDGs are meant to function as possible positive indicators of a social sphere that operates within biophysical boundaries. Overall, there was a sense that making creates diversity and networks of locally produced goods, both of which increases resilience through community.

Making was cited to create diversity in three primary ways: 1) making many small businesses, 2) creating community connections, and 3) encouraging multiple skills in any one individual person.

Making potentially lowers the ecological cost of any material or consumer goods by stripping away wider distribution chains, packaging. It could also engender greater value/care toward better designed artefacts that are meant to last much longer, be modular/repairable, and are aesthetically pleasing. It could also provide a new framework for individuals to find meaning in work and production, displacing conspicuous consumption and alienated work as a means for happiness and fulfillment. Maker Culture emphasises the importance of living within local ecological means, and of local community and interdependence. However, there is a strong caveat. Any seismic shift towards a local, bioregional, DIY, maker economy may have serious unintended consequences, as discussed throughout the chapter.

8. Final Discussions and Conclusions

This chapter offers some final remarks on the research outcomes in relation to general lessons learned and navigating the challenges. I also include a discussion on the limitations of my study (8.2) and areas for future research and my contributions (8.3).

8.1. Final Research Lessons

There are five initial and broad observations about the significance of Maker Culture as a model for the kind of adaptations that may become necessary in the face of coming global ecological and economic challenges:

1) Generate community-owned resources and production

While analyzing my MES work in China (Kish and Bunch, 2014) I found that change was difficult, if not impossible, in my problem situation because all the subsystems were owned and operated by the authoritarian government. For communities to have the ability to change or interfere with their systems, they need ownership over political action, and access to resources for local production. Municipal governments can empower their citizens. For instance, in Kitchener, any citizen can apply for a grant of up to \$20 000 to support a community project. The grants are easy to obtain and give communities the ability develop their corners of the city as they see fit.

Additionally, Makers and maker communities typically use materials that are locally sourced or traded with other Makers in their community – something ecological economists should encourage. This strips away the complexity of the global supply chain, and eliminates overhead costs such as transportation, packaging, mass advertising, and storage – all of which have a significant environmental footprint. When maker communities have decision making

capabilities and access to local materials, it significantly reduces environmental impact. It is in the government's best interest to empower these communities as much as possible. It reduces government overhead while giving citizens ownership over their life and city/space.

2) Governmental Catch-22

The idea of 'freedom' came up differently among the participants. For the younger generation of Makers, selling their goods on Etsy, making is important to them because it gives them freedom to travel and make their own schedule. For the older Makers, and more rural Makers, making provides freedom from the slog of an oppressive and mentally draining work environment or a way to participate in their communities.

For some, 'freedom' is much less benign. For the preppers and homesteaders their freedom is derived from a sense of independence from the government, protection from bureaucratic incompetence, and the ability to take care of one's family and self without having to rely on government structures of safety. If pushed on this topic, they become defensive. These people recognize that the future is uncertain and that they may need to rely less on global and national systems to keep themselves, and their family, alive and safe. They take pride in being able to do so and there is some excited anticipation at the thought of needing to do so. One participant said they'll be glad when it's time to "band together in the face of disaster" and another said, "the world will look a whole lot better when it starts to come to an end". It is important to these participants to undermine companies and the current system, and to be ready for when the failures of democracy finally make the system collapse.

These participants are a threat to cohesive governance. At the same time, these participants are actively building resilience and adding capacity to their local communities. It's

not just community gardens that their properties are equipped with – they have tools, knowledge and an ability to sustain people off their land with little to no help from the outside. These participants are both more resilient than others but make the whole system more vulnerable. On the one hand, the community capacity is bolstering and on the other already showing signs of outgroup antagonism.

Local and national governments are put into a tricky situation here. If a governmental body were to attempt to regulate these groups there would be significant pushback because at their core, they are against large-scale state intervention. If governments try to emulate it and force more local community capacity building, they're providing more fuel to the outgroup fire. There will end up being a lot of ideas but nothing that makes sense collectively and possibly a lot that could be points of friction in an era of scarcity. Additionally, when governmental bodies get too involved, they strip away the community empowerment of a group, but if they remain unregulated these ungoverned clusters will contribute to disfunction in the overall civil society.

This isn't just a catch-22 for government, it's a catch-22 for activists. Thinking back to Holloway's *Crack Capitalism*, it is possibly very effective to have these incohesive groups because they are collectively adding up to a resistance against capitalism. But without an overarching relationship, it could mean that after a 'fall' of capitalism, that there is just massive disagreement over what comes next.

If local governments and activist groups can empower communities of resilience that are building a resistance against capitalism while finding a way to connect them, through something like a class-based narrative, there may be a chance to weave a Canadian web of resilience. Ultimately, inequitable and disconnected systems are more prone to collapse, and therefore this

should be a central concern for ecological economists – we need to see local resilience that is broadly connected with just distribution.

3) Create ultra-affordable, recycle-able, and modular housing and goods

Although 3D printers are not commonly used in maker spaces (there is often one there, but not utilized), they are likely to become ubiquitous when the technology improves. Right now, the technology is too costly, but as the price comes down, Makers will be able to print any simple thing they need in their homes. In the middle of my field research period, a part broke off a fan we have in our home. The broken piece was a 4” long piece of plastic, with two hooks on either end – one of the hooks had broken. I called the manufacturer to see how much it would cost to fix – unsurprisingly, they said it couldn’t be fixed and we would simply need to buy new. Two weeks later, I attended a maker workshop at the Guelph Public Library, and brought the piece with me, along with a picture of the fan so I could show them how it attached. 40 minutes later, the broken piece had been printed – at no cost to me. This will be extremely disruptive to existing business models. Not only will companies have to start thinking about how to make their products modular and repairable, but they will also have to provide the files for printing the pieces that people need. This would work against cheap throwaway goods for more expensive and longer lasting goods.

If 3D printers become more pervasive, this story will be common. Not only will it be common, but companies will begin producing their products with modular designs so that people can upgrade and repair them (likely by purchasing the 3D printable plan from the manufacturer). This makes goods more affordable, less likely to be thrown away, and more likely to be kept for longer periods of time. People will potentially be able to make or 3D-print pieces of any product, finding design ideas and templates on the Internet. I am not optimistic about the future of 3D

printers. They are expensive to make (pieces are imported from China), rely too heavily on plastics, have too great of risk associated with them (people can print bombs and guns), and do not answer the problem of aesthetic value in life. The powerful outcomes of Maker Culture are the community, the specialness of products, and the higher quality of build. I don't see a large role for 3D printers in the future of a re-embedded maker community.

The very idea of repairable consumer goods is revolutionary enough on its own, but inexpensive, reusable, and replicable goods could change the face of poverty forever. There is potential for relatively high tech consumer artefacts to be produced with the home-brewed (Carson 2010) reparability of pre-modern artifacts founded in craft production. But this doesn't need to rely on 3D printing.

4) Return to the local landscape

Maker Culture on a larger or more holistic and embedded scale would rely more on locally available materials and would start from the assumption that people would be more satisfied even with reduced income and consumption of goods. Urban salvaging and reusing of existing materials would be necessary for success, and when these run out, locally sourced materials would be used as often as possible. Future Makers would see a marked reduction in the accessibility of global materials, which might help to reflect the actual cost of our goods.

Instead of paying \$5 for many cotton t-shirts, we may begin paying \$40 for one that we take really good care of. This means that Makers need to be aware of what is locally available and reconnect with their local landscape. In PEI, the clay Makers understood the difference between PEI soil and off island soil. The woodworkers knew what grew on one side of the island, versus the other side.

This kind of relationship to the land and local production requires a reorientation with how we consume and think about life. With a return to a local landscape, we would need to reconsider the kinds of things that we eat, wear, how we learn, and what we do with our time. As a mother, I recognize that this life would not be as comfortable for my child as my childhood was for me. There is significant risk involved with degrowth in general.

Historically, disasters have been periods of “social-levelling” (Klein 2007, p.497); shocks are likely to accelerate divisions between classes. Those that will be hurt the most are those who are already disadvantaged. This is evident in the New Orleans catastrophe where costs are borne unequally with the poorest people trapped in disaster zones while the wealthy were able to drive safely out of town (Klein 2007, p. 490; Rees 2002, p.256). This is why distributional efficiency is such a vital part of ecological economics as it would lead to higher societal welfare (Daly and Farley 2004).

5) An economy that contributes to personal mental health and wellbeing

Participants who left stressful mainstream jobs to become Makers, saw a significant improvement in their mental health. They all attributed this to becoming a maker. Some even reflected that when they stopped making, their depression and anxiety would return until they began making again. While my sample size is too small to make a generalized or overarching statement, it is backed up by various studies (Kouhia 2015; Riley, Corkhill, and Morris 2013; Smith 2015). Making seems to be a useful tool for improving mental health, especially in women

6) An economy that contributes to a community

While some Makers said that making was a solitary activity, in general Makers have a community centered around their crafting. Makers rely on networks of other Makers, in their community and online, to learn to perfect their skill and to share resources. There is also a

thriving gift and barter economy within maker communities – especially in isolated regions such as PEI. At maker events in cities, people commented that they felt like they were part of something bigger, and Makerspaces had a strong community element.

Overall, Maker Culture takes some of the most pervasive outcomes of modern society and reworks them to reorient economic demand (Figure 19 – Figure 20 is an earlier iteration of the figure with more detail (Kish and Quilley 2017)).

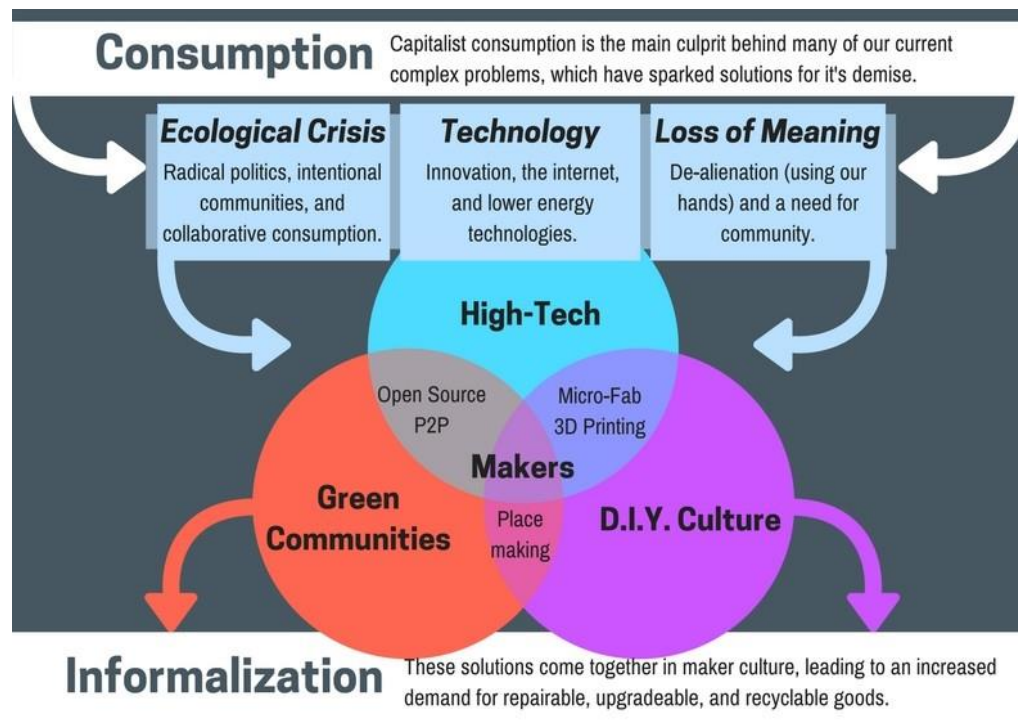


Figure 18: Elements of Maker Culture that combine to reorient economic demand

In this figure, the pervasive project of consumerism leads to ecological crisis, drives innovation and growth, and contributes to a crisis of meaning. The ecological crisis leads to radical sustainability politics, intentional alternative lifestyles, and collaborative consumption models. Innovation leads to growth in collective knowledge and the Internet. A crisis of meaning leads to alienation and a cry for community. These outcomes create the base for Maker Culture. It is a counterculture that is high tech, rooted in green localism, and makes use of the emergent DIY culture.

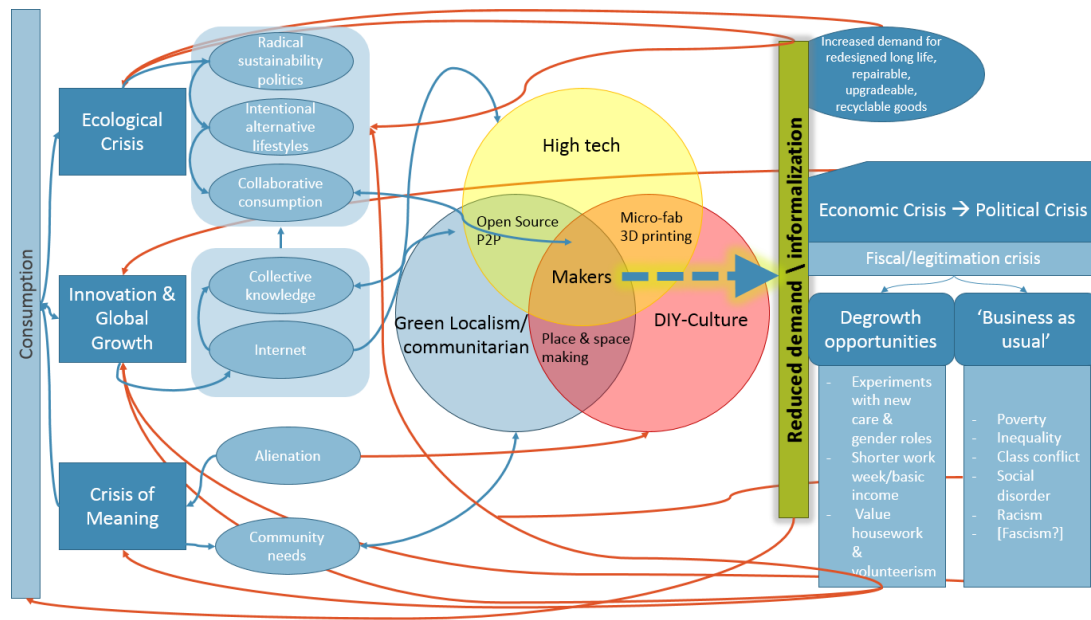


Figure 19: Earlier iteration of Figure 18 with the inclusion of unintended consequences and new feedback loops

Where the use of high tech materials and green localism meet, Makers see an increase in open-source and peer-to-peer sharing. Where high tech and DIY culture meet, Makers see Makerspaces. Where DIY culture and green localism meet, Makers see a sense of place and community emerge. These relationships collectively lead to reduced demand on the formal economy and an increase in informalization. That informalization is leading to a political crisis that can be answered in two ways. First, governments could simply not respond to it and allow economic transition to happen without taking advantage of this movement. Or, governments could see this as an opportunity to experiment with new approaches to economics, like Make It Kitchener has done.

Makers combine elements from the high-tech world, green communities, and D.I.Y culture – in doing so they implicitly encourage open source technologies, place making, and repairable/modular designs. All of which undermine the process of modern capitalism.

With these ideas in mind, I will recall my initial research question:

How can prefigurative communities of practice better inform systemic ecological economic approaches for cultural change and problem solving to maintain a progressive and high quality of life while remaining within limits of the biosphere?

The outcomes of this maker study suggest that a prefigurative politic, such as Maker Culture, can potentially provide a widely appealing alternative to consumer society. This alternative can easily be supported by a municipal government, such as Kitchener's "Make it Kitchener" economic development strategy, adopted as a hobby for individuals, and bring people together in a community setting. Maker Culture does this in a way that improves individual's self-esteem, disrupts the production chain in wider society, provides experience-based education opportunities, and is empowering for those who want to make a livelihood outside of mainstream systems. While doing so, it potentially reduces stress on the biosphere by providing meaning outside of consumption, supporting a culture of reduce, reuse, recycle, and encouraging a local economic system with elements of trade, bartering, and sharing.

This case study provides an example for ecological economists to take a different approach when thinking about imaginative futures, problem solving and policy development. The strategy for change can't end at ecosystem service evaluation, systems modeling, and encouraging renewable energy.

Employing a strategy that begins with the ecological economic social sphere will inevitably mean far greater complexity given context specifics. This is difficult, but important, because local groups need freedom to emerge organically, not be forced into something, while the state maintains higher levels of order and control. There is no one-size-fits-all environmental solution; it will be different for each municipality. Therefore, if an ecological economist is developing policy for a particular context, they should be looking for an alternative 'basin of

attraction' within the community that supports the positive social outcomes explored in Chapter 7. Ecological economists need to become experts in social opportunity by looking for key social indicators in the social context of a community. An ecological economic approach to policy development will contain elements of community-based participation, citizen owned production, reduced consumption and innovation, social reembedding, or open source approaches to ownership, depending on the kind prefigurative politics that may exist in that community.

Overall, reciprocity and redistribution need to be combined in new ways that would result in more localized, face-to-face relationships, and a redefining of success while continuing to utilize high-tech gadgetry and maintaining global empathy. This implies that ecological economists cannot simply argue for a change at the level of economic and energy institutions, but for a radically different pattern of socio-economic interaction and socialization that re-embeds social life into a local economy while simultaneously expanding the approaches to empowerment, global community obligation, and science so as not to lose vital progress in these areas.

8.2. Study Limitations

Some limitations of this study include research design limitations and impact limitations. The research design limitations included spatial, financial, and sample limitations.

Given the size of Canada, and financial restrictions, I knew I had to limit my study to specific geographic regions so that I could have regionally specific conclusions. This means that the conclusions cannot be applied across the maker community of Canada at large. However, focusing on PEI had its advantages. It made it easy to choose participants as the population is not large and it eliminated a lot of contextual differentiation that was making it difficult to find commonalities in Southern Ontario participants.

The Makers did not respond well to a survey I distributed online. I sent out a survey to 12 Maker groups on Facebook, 15 Makerspaces across Canada, 9 libraries with repair nights or tool libraries, and 18 elementary, intermediate, and post-secondary schools across Canada to collect general data on Makers. I received a total of 14 surveys back, far less than I wanted and far fewer than would have been required to make any statistically significant conclusions. No particular method was followed when distributing the survey, which is potentially why there was limited response. This may have been counteracted if I had included a reward or gift for participating but the budget for our study did not allow this. I also mentioned only receiving 8 q-sorts back from participants. This is likely due to the fact that I did not respond quickly enough after our initial interviews and participants were no longer invested in the research. However, I was not quick to follow up because I was given such rich data through my case study process.

I also had limitations in regards to who I spoke to. Many Makers are busy in the summer, and therefore during my trip to PEI many people who would have participated declined as they were unable to see me in the time I was in PEI. I followed up with 6 of them on Skype, which was sufficient for collecting the necessary data but not as enriching as spending the day with them in their studios or shops. While my sample size is large in comparison with other case study work, it is small in comparison to quantitative work. A well-designed survey focusing in on the thematics identified in this study would help to support the outcomes of this study.

The impact of the research outcomes is influenced by these factors. Given the regional specificity, the impact of the contribution is only specific to Prince Edward Island. I would not consider my findings in Southern Ontario as representative of the population here until I conducted more interviews with members of Makerspaces across a variety of cities. However, the conclusions of the urban and rural divide would likely be unimpacted by this and thus, it is

not a limitation of that section of the study – this is primarily based on my observations of the different groups and the literature on making.

Additionally, the EEDGs are based on Makers alone when they would be more strongly supported by researching a variety of degrowth communities. However, this framework now exists and can be tested against communities to determine its validity. It might be that a transition town does not have a strong Maker Culture but is still thriving. Based on preliminary research of Transition Towns it seems there is a DIY culture, but it is not clear how important it is to these communities. It would also be beneficial to include longitudinal effects of making overtime, but given my time constraints, this was not possible.

Finally, there is also a limitation in how the data was collected. The fact that we did two distinct research studies (Metcalf and my own independent study) lead to a number of confusing factors. It was difficult to calculate percentages because different questions were asked of different groups and interviews were not conducted with all research participants in the Metcalf study. Even in my own independent research, I was using a mixture of case study analysis, observational analysis, and ethnographical analysis of the situations I found myself in. While I did not include my research journals in the NVivo coding process, they undoubtedly impacted my bias when coding and writing up my discussion. I didn't include my research journals in the coding process because I wanted the coding to be reflective of the participant's words, not of my observations. Including the percentages helped to alleviate some of this bias – in one case I had originally written “most Makers” but the percentage was less than 30%.

8.3. Future Research and Contributions

While my broad critique of ecological economics and proposed framework call for significant future research and reiteration, seven other interesting research areas emerged:

1) Expanding the Q-Method

Having only received 8 Q-sorts back from my participants, I could not draw any conclusions. All 8 Q-sorts that I received back were from rural participants, and the initial results are consistent with the group's overall characteristics. Initial results point to an issue with out-group antagonism, as many indicated that in a survival situation, only their immediate family or community would be important to them. While they did not indicate any interest in directly undermining corporate or capitalist interest, they all ranked alternative economic exchanges as quite important to them (gifting, bartering, and sharing). They also indicated a dislike toward technology, which is inconsistent with one of my take-aways from this project (that technology such as 3D printing will be pervasive in Maker Culture in the future), but performing the Q-set with urban Makers may counter this point. Performing the Q-methodology in the future would help to draw out the wicked tensions of communities. While the Makers tend to be liberal and empathetic, they seem to move toward out-group antagonism when faced with a crisis. There may be other contradictions to uncover in these communities, and other environmental communities at large.

2) Other approaches that improve community, self-esteem, and provide meaning

Many of the participants in this study were interested in other creative outlets in life such as music, theater, and religion. More research is needed on other kinds of prefigurative politics that could have enormous power for undermining capitalist consumption in a community. The

list of the kinds of political and community oriented activities that have social outcome consistent with the social sphere should be as long as possible. This will provide municipalities with a variety of choices from improving the resilience of their community by encouraging them to support the prefigurative political groups in the environmental movement.

3) The specific implications of reducing consumption

I have reiterated that if a society reduces consumption, then there will be fewer tax transfers and therefore less money for governments to use on social spending. This is a serious consideration for ecological economists. A comprehensive study should be done to see if reducing taxes via patterns of consumption do interfere greatly with the state's ability to provide social services. It might be, that there could be sufficient reorientation of spending (less on health care and military) that society could adjust. It could also be the case that some of the other economic applications that support a health social sphere will include those that help make up for, or take place of, social services – such as the re-emergence of 'the village' in childcare (grandma helps more) or people begin caring for roads and bridge construction as a part of their commitment to their community. There are possible solutions, and it is important to figure out exactly how much tax revenue a given community might lose, the kinds of global trade systems that might breakdown in the face of reduced consumption, and ways that governments could respond to these challenges.

4) Connection between community, empowered women, and environmental protection

Most of my participants were women. I believe this is because women are more often practitioners of alternative economic activities. It would be interesting to do a study that examined exactly how much volunteer work was being conducted, by both men and women, and

to transfer this into monetary terms for a community. For example, in Kitchener, the community gardens are often frequented by women, the free child care centers are staffed with women volunteers, and the Economic Development Department of Kitchener believes that women are behind most of the community work done across the city. If the amount of work that women do could be translated into dollar amounts, the stigma that women are not contributing to the field of ecological economics could be entirely abolished – because likely, women are generating enormous amounts of ecological economic activity. Women who are empowered by their community to keep up this work could have huge implications for environmental protection. This research could be extended to include the ecological economic activity provided by indigenous peoples through traditional ways of living and the role of environmental justice in positively contributing to sustainable local economic development.

5) Unintended consequences of change and degrowth

As mentioned throughout this paper the Footprint Accounts tell us that as countries move toward meeting the UN Sustainable Development Goals, they use more resources and begin to run an ecological deficit. A main question arose at our second Ecological Footprint workshop in Toronto: can a country remain within its biocapacity while meeting the minimum needs for social development? This question is of utmost importance to environmentalists and policy development, because if it is possible, then it should be the goal of all countries to do so. I would like to create approaches for investigating this largely philosophical question on an empirical level.

6) What does re-enchantment look like?

An area that was of interest to me is the problem of ontology and meaning in life. Stuart Kauffman argues that the positivist tendency to focus on the foolishness of spirituality detracts from deep aspects of humanity (2008, p. 8), which contributes to anxieties. Kauffman and others have turned to a re-enchantment of science to counteract negative outcomes of the process of rationalization (Chaisson 2001b; Sagan 1985, 1997, 1998; Tyson 2004), arguing that cycles, regularity and knowledge of the universe do not have to demystify the world. Rather, these cycles and knowledge can become the basis for ritualistic behaviour and a door for curiosity and wonder about the universe.

Brian Swimme, in his book *The Universe is a Green Dragon* (2001), asks if a cosmological re-enchantment can exist within a system that allows us to see an enchanted vision of the cosmos – if scientific rationality, the foundation of the problem of disenchantment, is also required for reenchantment and therefore potentially useless. This tension between science and meaning is a question of great interest to me that I would like to research sometime in the future.

7) Making and education

There is a huge opportunity for researching the role of making in education in three ways:

First, if making was incorporated into the education system as a mandatory component for all students, it could lead to less anxiety and mental health issues in high schools. Students participating in experiential education have different outcomes than those learning from their desks. Education that incorporated the hand and brain relationship could also have enormous benefits for students in their overall educational experience. It could also translate to an increase in repairing and recycling in students.

Second, making could function as a platform for teaching people the energy associated with production. If a series of classes were taught to do a simple task, such as make a bar of soap from scratch, or to start a fire without fuel or fire starters, it could establish an appreciation for the energy that goes into the production of goods.

Finally, the very nature of make culture has a component of mentorship and relational learning. People learn the skills as they are needed, and they learn these skills from trusted friends and community members. The impacts of this kind of learning could improve community relationships overall, and reorient how we view effective education strategies.

These areas for future research notwithstanding, this dissertation contributions to the fields of ecological economics and socio-ecological systems transformations. My most significant contribution is to the discourse and methodology for ecological economics. In this research I began to discuss what a healthy social sphere that is supportive of a sustainable and vibrant biosphere might look like. I connected these possibilities with practical economic activities that, if activated, could help re-embed the economy in society. This framework is a theoretical advancement in ecological economics, particularly in reigniting a conversation on envisioning imaginative futures for ecological economists to work towards achieving. This framework can be used to explore approaches of community groups and to create recommendations for change. No ecological economic frameworks exist that serve to both critique approaches from a cultural perspective and offer solutions in a similar vein – the closest example to this is Spash’s attempt at creating a set of standard ‘ethics’ for ecological economists.

This framework needs a lot more research. I would like to apply it to a city such as Toronto or Vancouver to see if it can help pull out the kinds of prefigurative politics that the municipal governments in those areas could develop policy around. While these wouldn’t

necessarily look like environmental policies, they would directly work towards keeping the economy within the bounds of society and the biosphere.

The second contribution is in suggesting a new kind of approach for ecological economists in framing a new kind of feminism. This is a challenge to mainstream feminism and conventional approaches taken in the social sphere within the ecological economic agenda. As part of a larger suggestion for a new environmental future, we'll need to be much more circumspect and generous in what we consider 'successful' by empowering a resistance from the domestic sphere.

I have also contributed to the discourse on Makers. I have demonstrated that among geographically bounded Makers, there is a strong barter, gift, and trade economy. This informalized economy is also present in other maker communities, such as maker spaces and online clubs, but not as pervasive. The informalized economy in PEI was very strong. Participants were getting necessities of life through this economy. While making has always been connected to the informalized economy, this is the first research demonstrating the strong relationship between making, bartering, trading, and sharing – suggesting that as making grows, it could undermine the economy in more ways than just production. This research also adds to existing research on Makers in three ways, it helps demonstrate that: 1) maker spaces and events are potential hubs for establishing meaningful community ties with wide appeal, 2) making increases self-esteem and gives the maker a feeling of satisfaction, and 3) making can function as a ritual, eliciting feelings of flow and trance like states.

Finally, my research also provided some initial evidence that degrowth may not be a “liberal agenda” (Quilley 2012) by showing the increase in out-group antagonism within some of the maker communities, a tendency for urban Makers to be anti-science and rural Makers to be

anti-technology, and that making undermines growth (which could directly undermine the liberal agenda). I tested if these kinds of dilemmas are visible to practitioners of low-growth economics, and while it requires further research, the outcomes suggest that they are not. This is significant because it is contributing to an initial conversation about the kinds of things we have now, that we might need to give up en route to a sweet spot between social progress and sustainability.

8.4. Conclusion

I have asked that if now is the time for reorganization, what kinds of prefigurative politics should ecological economists look to promote? Maker Culture functions as one option as it has mass appeal, while demonstrably improving self-esteem and reducing individual consumption. While making is not the end solution, it is one of many possibilities for municipal governments and environmental movements to consider.

Some modern Makers also see their work as an implicit protest against rising inequality and environmental degradation. By teaching people how to repair and build they are helping those who are unable to afford to buy new products. By producing quality goods they are protesting against “throw-away” society. Not only is this a strong anti-capitalist stance, but as Tim Ingold argues, the process of making is a mindful activity (2013). My research indicates that this mindful process enhances the self-esteem of kids and adults by producing a product that they are proud of. With making, an old vision of embedded production, where production is tied with the needs of a society, and community is re-emerging with new technology as a prefigurative politic across the globe.

Decades of research by specialists in Ecological Economics has produced little that bridges the gap between economic growth and small-scale lifestyle innovations that have little or no traction on the whole system. Modern Maker Culture has made it possible to once again consider the possibility of a small scale, locally oriented, low-impact form of society, that does

not have to give up everything in modern society. Instead, Maker Culture can be part of a mosaic of ecological economic applications, across a variety of contexts in Canada, to promote a sustainable relationship between the biosphere, social sphere, and economic activity.

Ecological economics is a powerful discourse for reorienting our view of the economy. By placing the economy as a subsystem of the environment, the discipline challenges economists and policy Makers to make decisions within planetary boundaries – to account for externalities. However, far too often this has been done without consideration that the economy is also nested in the subsystem of society. If ecological economics is to progress, practitioners need to internalize the importance of culture and behaviour in ecological economic decision making. The kinds of social practices that push the limits of the biosphere need to come under scrutiny and economic applications that undermine these social practices should be put into place. I have placed these conditions on the initial figure from ecological economics (Figure 3) as a way to encourage ecological economists to consider the implication of their work across all three subsystems, and to recognize that society and economy are two dynamic systems that are constantly changing one another (Figure 20).

Ecological economists must take Daly's original injunction seriously. They need to stop ignoring the social sphere and give more credence and promotion to radical eco-cultural prefigurative politics that put culture and society at the center of their economic approach. Maker Culture alone demonstrated an increase in self-esteem, stronger family and community ties, connections with place, and the widespread use of an informalized economy, and this is just one of many possible prefigurative movements. Given that the UN SDGs are incompatible with biosphere integrity, ecological economists should find more lessons in these groups to strengthen

the EEDGs and use them to suggest environmental policy that is beginning to respond to the reality of systems transformation in a more holistic fashion.

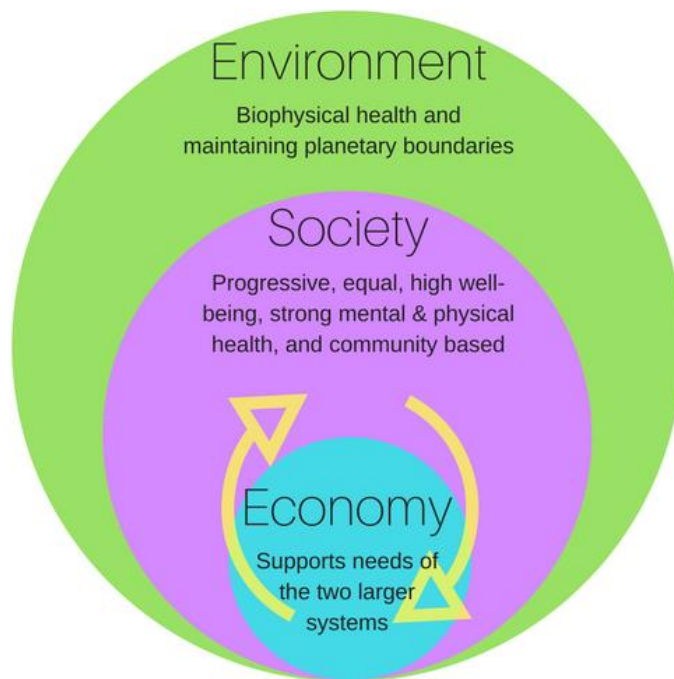


Figure 20: Ecological Economic Framework 2.0

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Appendix

1. Interview Questions

- a. Please explain the kind of making/creating/fixing/building that you partake in.
- b. What are your making experiences as a child? Do you have children now and in what capacity are they involved in your activities? How have children changed over time? Does education tend to focus less on hands-on? What kind of impact does this have?
- c. Within what context do you primarily make things? What has been more important to you – formal or informal qualifications for your craft? Do you primarily focus on instrumental/useful items or is it primarily a hobby for you?
- d. Is your craft tied to a social element for you? Is it more of a solitary activity? Is sharing your craft important to the process?
- e. In your experience, how has craft and making changed overtime?
- f. In your opinion, does your craft impact the economy?
- g. In your opinion, does your craft impact the environment?
- h. Why do you craft? How does it make you feel?
- i. Is there any religious, spiritual, or ritual elements to your craft? What drives your crafting?
- j. Is boredom a fundamental element to development? Were you bored as a child? Is your making an outcome of boredom?
- k. Do you have a personal project, tied to your craft or something else? Do you have a bucket list? Does your craft interfere with other plans in your life?
- l. Do you play an instrument? If so, does this have the same kind of meaning to you as crafting?
- m. Do you have a community around crafting? How does this community impact your life?
- n. What trade-offs, if any, do you make for your craft? (ie travel, eating out)
- o. Why is your craft worth any potential trade-offs?
- p. How much is your making a rejection of the current system (consumerism), if at all?
- q. Do you feel like there has been a failure of democracy and modern society? How so?
- r. What does the future of your craft look like?
- s. Does your craft tie you down geographically? Is this a positive or negative benefit of your craft?
- t. Is there a different economic structure that you think would be more successful than that which exists now?
- u. How much does your working interfere or overlap with your everyday work life? What is more important to you? How do you view work?
- v. Do you feel 'heard' as a citizen? What is your opinion on large technology and economic giants (Google, Nestle)?
- w. What do you get out of this? How does it fulfill you?

- x. To what degree does your craft define who you are?
- y. What do you value most in life?

2. Q Set

Science and Economics

1. Science and scientific advancements are the best for human progress.
2. Science has a place in academic institutions but not in dictating individual lives.
3. Enchantment and wonder can be obtained through scientific understanding.
4. It is more important to have privacy than have universal access to scientific advancements.
5. Scientific advancements do not outweigh the damage done to society.
6. Scientific advancements do not outweigh the damage done to the environment.
7. Health care is the most important scientific advancement.
8. Agriculture is the most important scientific advancement.
9. Women and men should have equal access to all areas of life.
10. Astronomy and the search for extra-terrestrial life is the most important scientific advancement.
11. Everyone should have equal access to all scientific advancements (excluding weaponry).
12. Everyone should have equal access to all scientific advancements (including weaponry).
13. Profit is compatible with sustainability.
14. A small-scale community is an ideal situation for the future.
15. Copy-right laws protect the information and outputs of individuals.
16. Information should be stored privately (personal physical copies or personally owned server/backup device).
17. Exploring the universe is the next great feat of humanity.
18. By leaving Earth humans are abandoning their humanity.
19. In a disaster situation I would survive without scientific advances.
20. In a disaster situation the only scientific advance I would need is medical care.
21. In a disaster situation the greatest loss would be access to health care.
22. In a disaster situation the greatest loss would be access to advanced agriculture.
23. It is important to me to own my own means of self-care (lawn tools, kitchen gadgetry).
24. The money I make at work is for my family and me.
25. In a small scale community, it would be okay for social reintegration of stereotypical gender roles.
26. Everyone should give up to 20% of their income to taxes and charity.
27. Everyone should give up to 50% of their income to taxes and charity.
28. Work weeks should be only four days.
29. A decrease in consumption (and thus government taxes) would have few negative implications on society.
30. A decrease in consumption could have dangerous consequences for society.

Values and Globalization

1. It is important that every individual have the ability to create, share, and express his or her ideas without barriers.
2. Individual integrity is important for self-worth.
3. Barter economies express the value of goods better than capitalist economies.
4. Capitalist economies express the value of goods better than barter economies.
5. In a disaster situation I would only care for my immediate community.
6. Education is a fundamental right that should be available freely to all people.
7. It is impossible to 'own land'.
8. Music is essential for life.
9. My family gives me a great sense of completion.
10. Claiming ownership of land is a fundamental flaw of society.
11. Technology has vastly improved humanity.
12. My immediate relationships are fulfilling.
13. Rights and laws are universal.
14. Rights and laws are dependent upon the cultural context.
15. Having access to computers and the internet is a fundamental human right.
16. Computers and internet are fundamental to how I live.
17. I feel a sense of pride and ownership over my privately owned home.
18. Any level of government should not have secrets.
19. I believe in a higher power.
20. Rituals are important in my day-to-day life.
21. It is acceptable for the government to have a set of secrets for the protection of citizens.
22. I feel a sense of obligation to strangers overseas that I have never met.
23. In a state of emergency, I would only care about my immediate community.
24. Altruism is a great virtue.
25. One's commitments should be focused on one's community.
26. Governments have control over laws and rules because that is the fairest approach.
27. The legal system is necessary.
28. I would feel comfortable taking the law into my own hands.
29. I prefer to exchange services rather than money.
30. Gift giving is an integral part of a holistic community.

Environment

1. My car is an untradeable accessory to my individual freedom.
2. The public transit system is an integral part of urban design and planning.
3. I am aware of the cost of my trip in a car.
4. You are what you drive.
5. A Prius is a more environmentally friendly car choice than an older car.
6. My work requires me to drive.
7. I am too busy to ensure I am making environmentally friendly decisions.
8. I try to consume as little as possible (goods such as clothing, books, accessories).
9. I am fully aware of where my food comes from.
10. I have grown my own vegetables.

11. I have killed and prepared my own meat.
12. On days when I do not drive my car I am greatly inconvenienced.
13. Cheaper food from a supermarket is preferable to costly food at a farmer's market.
14. If I have to grow and/or prepare my own food, I am greatly inconvenienced.
15. I would trade a shorter work week for less income.
16. I would trade a personal garden for less time shopping at the supermarket.
17. I would trade the ability to buy clothes for more time with my family.
18. Making things gives me a great deal of satisfaction in life.
19. I would make everything in my home if I could.
20. If a \$20 appliance in my home broke, I would throw it away and buy a new one.
21. If a \$20 appliance in my home broke, I would attempt to fix it.
22. Community is integral to environmental sustainability.
23. Environmental efforts are pointless because we have passed a 'tipping point'.
24. The next great global disaster will be environmentally related.
25. I like to buy new things for my home.
26. I have a certain home aesthetic that I like to live within.
27. Older goods are better than new goods, for any reason (aesthetic, quality, etc.)
28. Localised communities, separate from the global society, would function well.
29. Localised communities, separate from the global society, would be doomed to fall apart.
30. Environmental collapse is on the horizon.

Glossary

Alienation: Alienation is that sense that one's own ability as a human being is taken over by other entities (Ollman, 1977). It is an individual's feeling of estrangement from culture, groups, situations or work leading to dissatisfaction due to lack of involvement. Originating from Marx (Marx and Engels, 1844), others have discussed alienation as a critique of industrial work (Braverman 1974; Morris Berman 2012) and the psychological impacts of alienation (Becker 1973; Giddens 1990). Giddens argues that the more capitalism advanced, the more alienated the workers became (1973, 11), as strict social stratification develops.

Anomie: Anomie refers to a situation in which social norms lose their hold over individual behaviour. In *Suicide* (1897), Durkheim popularized the term 'anomie', meaning 'without norms'. He defined it as "derangement" and an "insatiable will" (Durkheim 1897, 247), which grew as society failed to provide moral guidance to individuals. This is an outcome of disenchantment, rationalization, the division of labour and a gradual breakdown of social bonds (Morris Berman 1982b; Durkheim 1897; Tönnies 1887). The breakdown of social bonds lessened a wider social ethic, leading to an imbalance between personal and societal ideals producing moral ambiguity. Anomie is not inherently associated with an absence of norms, but with a mismatch – severe moral rigidity in society could also produce levels of anomie.

Civilizing Process: Elias's *Civilizing Process* is a founding text in figurational sociology. It covers the process of civilization from 800 AD to 1900 AD. Elias traces how standards of violence, sexual behaviour, manners, speech, shame and etiquette transformed in Europe. Elias demonstrates an increasingly complex network of social conditions/connections that internalize 'self-restraint'.

Cosmopolitanism: Cosmopolitan ideology is founded on the notion of global community and morality (Kant 1795); characterised as a more open culture with less ‘ethnic particularities’ (Haller and Roudometof 2010). Cosmopolitan attitudes are a product of institutional and political contexts at various nested levels of social hierarchy (immediate circle, neighbourhood, state, country).

Creative Destruction: The increasing pace of change, increasing technological sophistication in England and the political potential of the American and French Revolutions alongside capitalism’s constant tendency to transform itself supported a growing idea of modernity as a consistent process of ‘creative destruction’ (Schumpeter 1942). Schumpeter argued that capitalism, by nature, is constantly changing because the fundamental impulse that feeds capitalism is new forms of consumer goods, production, transportation, markets and industrial organization. Opening of market and innovation in the process of production and consumer wants destroy previously prioritized markets and methods, this sustains economic growth.

Disembedding: Erich Fromm highlighted the importance of human disembeddedness from nature by stating “self-awareness, reason, and imagination have disrupted the ‘harmony’ that characterizes animal existence. Their emergence has made man into an anomaly, the freak of the universe. He is part of nature, subject to her physical laws and unable to change them, yet he transcends nature; he is set apart while being a part; he is homeless, yet chained to the home he shares with all creatures” (1977, 320). Fromm is arguing that a person’s instinct is to distance themselves from these ‘savage’ realities in nature, demonstrated both physically (cities), psychologically (sexual repression) and symbolically (rationalization and utopian visions of nature). Polanyi argues that in economic systems disembedding is demonstrated through the shift to institutions as the primary organizers of economic activity and processes (1957).

Disenchantment: ‘Disenchantment’ is a cultural devaluation of myth in favour of a scientific and goal oriented culture (M. Weber 1958). Sociologists argue that the “regularity” and “monotony” of absolute and positivist science (Durkheim 1912, 84) insufficiently replaced necessary social and moral direction that religion provided.

Division of Labour: A *technical division of labour* consists of the separation of work tasks, hierarchies of skill and workers from management through power/authority structures. Social organisms grew within a constant process of division and specialization in response to work and social environments (Kumar 1991, 84). This led to segregated classes, genders, races, and religions. The process of specialization in society, and the separations within social life into different activities (family, state, economy) is part of what Durkheim calls the *social division of labour* (Durkheim 1893), creating segregated sections of society (class, sectorial patterning of employment, geographic concentration of certain types of employment). Implications of both kinds of division of labour are central to sociological theories on social stratification between classes, genders, races, and religions.

Formal and Substantive Rationality: Weber uses ‘formal’ rationality in reference to simple means-end rational calculation. For instance, an individual has a goal and takes rational steps to achieve it based on past experience, logic, observation or science. ‘Substantive’ rationality refers to logic within a context of ultimate ends and/or values, making it much more ambiguous (Weber, 1921). Substantive logic is focused on problem solving within a larger system of values as opposed to specialised and technical thinking that began to dominate modernity. Bureaucratic organizations function using formal rationality – run by narrow specialities and rule guided decision making.

Gemeinschaft and Gesellschaft: In *Gemeinschaft and Gesellschaft* (Tönnies and Loomis 1887; Giddens 1990, 115), Tönnies outlines a dichotomy proposing that social relations can be divided between Gemeinschaft (‘community’), personal/primary relationships, values and roles or Gesellschaft (‘society’), indirect/secondary, impersonal relationships, values and rules. Much like Durkheim’s notion of “solidarity”, the dichotomy suggests the need for affirmative social primary relations (Cahnman 1994). Tönnies argued that corrosion of early forms of Gemeinschaft relationships and the weakening of immediate forces within society left only a detached individual more susceptible to the emerging super-states. He later (1921) related these concepts to works of Marx stating that the worker and artist were typically persons of Gemeinschaft while merchants, traders and production managers were persons of Gesellschaft. The secondary relationships took precedence over primary relationships with the emergence of ‘trade’ and capitalist enterprises; Gesellschaft relations were inherent in a capitalist economy.

Individualization: The rapid passing of time, increased mobility, and self-centred necessity for work facilitated *individualisation* (Cahnman 1994; Giddens 1990; Hobsbawm 1999; Tönnies 1887; Tönnies and Loomis 1887; Weber 1921). This increased individual freedom and identity came at the expense of social connection. Ferdinand Tönnies, later expanded on by Weber and most recently Zygmunt Bauman, argue that the process of modernization resulted in increased individual freedom and identity at the expense of social connection and a personal sense of purpose, belonging and ability (Bauman 2000; Tönnies 1887; M. Weber 1958).

Modernity, Modernism and Modernisation: Modernity is the experience of people in modern society. Modernisation is the process into becoming within the modern world. Modernism is how individuals make sense of the modern world.

Organic and Mechanical Solidarity: Organic solidarity is the social cohesion that results from various areas of society function as an integrated whole. Mechanical solidarity is based on kinship ties. Durkheim (1893) characterizes pre-modern societies as having a low technical and social division of labour and social stratification, having a strong “collective consciousness” or “mechanical solidarity” while modern societies have a strongly individual consciousness or “organic solidarity”. The division of labour encourages organic solidarity as it separates people into groups based on specialized tasks, interests, or characteristics.

Post-Normal Science: Post-normal science is required when stakes and uncertainty are high and time is limited, as with challenges of today (Funtowiz and Ravetz, 2003; Hessels and van Lente, 2008). New approaches are deemed “post-normal” as they do not seek to replace the current scientific paradigm (Kuhn, 1962) - instead, they seek a different, non-reductionist, approach.

Rationalization: Rationalization is the general tendency of modern capitalist institutions and societies to be transformed by applications of rationality (Jary and Jary 1995) through the embodiment of the scientific method to master the natural and social world (K. Kumar 1991, 103). Weber, Schumpeter and Mannheim describe the essence of rationalization, an outcome of industrialization (K. Kumar 1991, 102), as the dissemination and deepening belief that we are able to control the world and events around us (Blokland 2008; Schumpeter 2006; M. Weber 1958).

Risk society: Late modernity is characterized by the globalization of risk, the institutionalising of risk environments, growing awareness of risk and awareness of the limitations of expertise around risk (Giddens 1990, 124). Scholars argue that society fundamentally shifted from being

characterized by industrial class based struggles (unity over “I am hungry”) to being characterized by the “risk society” (unity over “I am afraid”) (Beck 1992, 10). These larger risks, such as “eco-threats” like nuclear disasters, cut across inequalities. The pervasiveness of risk is not due to a more inherently risky life, but because the conditions of modernity make the analysis and contemplation of risk much more present, resulting in increased anxiety (Wilkinson 2001).